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The Preparation and Certification of Industrial Arts Teachers in Canada

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THE PREPARATION AND CERTIFICATION OF INDUSTRIAL ARTS TEACHERS IN CANADA

by

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Problem

The purpose of this research was to analyze the preparation and certification of industrial arts teachers in Canada and to devise a recommended program for industrial arts teacher education for Manitoba.

A solution to this problem was sought through an examination of the problems of teacher preparation in Canada, certification practices, and industrial arts teacher preparation programs and recommendations in line with the best practices available were made.

Procedure

Data were collected, tabulated, and analyzed from various sources, including teachers, teacher-educators, and department of education officials throughout Canada by means of correspondence, consultation, and the review of pertinent documents. The teacher preparation systems of the provinces of Manitoba and Alberta were selected for more detailed study on the availability of information and because they afforded typical examples of the two major approaches to industrial teacher education. Information was also obtained from teachers in the provinces of Alberta and Manitoba as well as teacher-educators and other officials by means

of an opinionnaire. A one-way analysis of variance and the Dunn's "c" test were used in making a comparison between the groups reporting.

Results and Conclusions

This research was intended to provide descriptive data of existing conditions in the preparation and certification of industrial arts teachers in Canada with the assumption that the information obtained would facilitate further research.

Some of the more significant results of this research lie in the thinking and practices of those engaged in teacher education. For example, the findings of the study indicated that almost general agreement existed among the three major groups involved in teacher education, i.e. teacher-educators, teachers, and department of education officials, on the need for a basic four-year program of teacher education for both academic and industrial arts teachers.

An analysis of the data further revealed that there was a great deal of similarity in all the pre-service programs conducted by provincial universities for teachers, apart, that is, from the area of specialty. Approximately one third of the total time allotment of these university-centered programs was required for general education studies for teachers of general academic subjects and industrial arts alike.

In the available data related to department of education teacher-preparation courses it was noted that professional studies and skill

training absorbed the majority of the required teacher preparation period. However, the value of many department of education courses is recognized throughout Canada, and, accordingly, most universities allow them partial credit towards a degree standing.

The certification of teachers in Canada remains solely a prerogative of the respective provincial governments. This provision has remained relatively unchanged since the passing of the British North American Act of 1867. However, there is a pronounced trend in Canada to place all forms of teacher education in the hands of the provincial universities and other indications of consultation and cooperation between governmental officials, trustees' organizations and members of the teaching profession in respect to certification and preparation.

Other conclusions drawn from this study were that the requirements for teacher certification in the various provinces of Canada present a somewhat confused and conflicting picture as each province appears to have different entrance requirements, periods of preparation, and certificate nomenclature.

A four-year teacher preparation curriculum was recommended for industrial arts teachers in Manitoba based upon a comparison of existing programs in Canada with those suggested by leading educators in the area of industrial arts. Of all the industrial arts programs analyzed in this study, that of the province of Alberta appeared more nearly to

meet the general education, the professional, and the concentration requirements of a well-balanced teacher education program.

CHAPTER I

INTRODUCTION

The Problem

The problem was to analyze the preparation and certification of industrial arts teachers in Canada and to devise a recommended program for industrial arts teacher education for Manitoba.

A solution to this problem was sought through an examination of the problems of teacher preparation in Canada, certification practices, and industrial arts teacher preparation programs and recommendations in line with the best practices available were made.

1. Certification (Core Data)

    a. What agencies control the certification of industrial arts teachers in the various provinces in Canada?

    b. What are the requirements for teacher certification throughout the provinces?

2. Preparation of Industrial Arts Teachers (Core Data)

    a. What provisions are there for the education of industrial arts teachers in provincial departments of education and universities?

    b. What provisions are made in the various provinces for industrial arts teachers to obtain degrees with a major in their area of specialization?

c. What relationships exist between provincial departments of education and the teacher-preparation institutes?

3. Teacher Education Programs (Core Data)

   a. In what manner do the preparation programs, including general education, professional education, and the teaching specialty, of industrial arts teachers agree with those of other subject area teachers?

4. Comparison

   a. How do the representative programs of certification and teacher preparation for Alberta and Manitoba compare?

   b. What is the present trend regarding the preparation of industrial arts teachers in North America?

   c. What is the relationship and responsibility of industrial arts to general education?

5. Recommendations

   a. What recommendations may be made regarding the certification of industrial arts teachers?

   b. What recommendations may be made for a revised program of teacher preparation in industrial arts education for Manitoba?

Explanation of the Problem

While many attempts to improve the caliber and quality of general teacher education programs in Canada are being made, there has been a marked lack of formal research designed to improve industrial arts teacher education. This fact constituted a barrier in the solution of the problem. To answer this problem, it therefore became necessary to

examine the general subjects and industrial arts teacher preparation programs in Canada and teacher certification practices in order to make valid recommendations for industrial arts teacher education for Manitoba.

Throughout the Dominion of Canada there has been a continued interest expressed in all phases of teacher preparation and certification. The desire to provide a unitized and improved system of teacher education has led a number of provinces, particularly British Columbia, Alberta, Saskatchewan, and New Brunswick, to place all forms of teacher preparation under the control of their respective provincial universities. Previous to this, most provinces had a multi-track approach towards teacher education whereby elementary teachers and many non-academic teachers would receive their education at provincial normal schools or teachers' colleges while secondary teachers would receive a university-based program of preparation. High school teachers of academic subject areas were required to enter the faculty of education of a recognized university and take either a one-year or a two-year course of professional training. Some provinces required the one-year program for professional study while other provinces considered two years preparation as a minimum background for professional competence. A common practice in Canada, regardless of the length of the preparation period for professional study, was the insistence of the universities upon a basic undergraduate degree in arts or science prior to any professional study in teaching.

Counselors and teachers of industrial arts, vocational education, and physical education were prepared through provincial teachers' colleges or technical institutes. These institutions were staffed and the content of the courses was determined by the department of education in the various provinces. After the completion of a one to two year post-high school preparation period, successful candidates were issued certificates to teach in either the elementary, junior high, or senior high schools. The situation today in many provinces of Canada regarding teacher education programs, as indicated previously, is that most forms of teacher training are conducted by the universities. The position or classification of industrial arts education, however, remains an area of uncertainty in the minds of some educators. Svendsen, in 1963, stated that, "it seems strange that such an area of study should lack prestige and be refused a position of importance equal to that of any other area of the curriculum."[1] Olson made somewhat similar comments when he stated that the industrial arts profession, "has been marked by diversity of concept rather than by unity."[2] In the light of such comments it is scarcely surprising to note that Gallagher should indicate

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[1]E. A. T. Svendsen, Action and Thought in Industrial Arts Education, 12th Yearbook, American Council on Industrial Arts Teacher Education (Bloomington, Illinois: McKnight and McKnight Publishing Co., 1963), p. 17.

[2]D. O. Olson, "Technology and Industrial Arts" (published Doctoral dissertation, Kent State University, Columbus, Ohio, 1957), preface.

in his thesis that, "every major aspect of industrial arts education is in need of research."[1] When such uncertainties exist in its functions and objectives, its teaching methods, its relationship and responsibility to general education, its lack of a logically-consistent theoretical structure, and its program offerings, it is quite understandable that the problem of devising a suitable industrial arts teacher education program would occur. It is believed by the writer of this dissertation that the conditions mentioned above are partially responsible for the fact that teachers in the subject area of industrial arts, particularly in the province of Manitoba, are often still not included in the university-centered programs of teacher preparation.

A significant part of this study was the inquiry into contemporary teacher education theory and practice so that the recent changes in the teacher preparation programs in Canada could be evaluated, especially as they apply to industrial arts teacher preparation. In identifying current practices it was necessary to gather basic data on teacher certification agencies and practices in Canada in order to determine the level of preparation required to teach both academic and non-academic subjects. The close alliance of provincial certifying agencies with teacher education institutions made the examination of present conditions

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[1]James Emmet Gallagher, "A Descriptive Analysis of Industrial Arts in Alberta" (A Master of Education thesis, University of Alberta, 1963), p. 2.

and trends in matters of control and cooperation between the groups involved in teacher education an important part of this research.

Another reason for making this study was to discover whether or not an unwarranted discrepancy existed between general and industrial arts teacher education programs in terms of quality, duration, and opportunity to qualify for degree standing in areas of specialty.

Further data were gathered through correspondence and consultation with representatives of the Faculty of Education of the University of Manitoba and the Manitoba Institute of Technology so that an alternative and strengthened program for industrial arts teacher preparation for Manitoba could be developed.

Scope and Limitations

This study was limited mainly to the comparison of general and industrial arts teacher preparation and certification in Canada. Recourse to research in the United States and elsewhere, dealing with the education of prospective teachers, was made to the extent of its relevance to the Canadian educational scene. Though all of the provinces were surveyed in this research, a more detailed analysis of the teacher training systems of British Columbia and Alberta was made possible by the wealth of data provided by these two provinces.

Limitations of this study also occurred in the final proposals for an improved program of industrial arts teacher education program for

Manitoba because of the limited number of people involved and the time and effort that such officials could allow for interviews and conferences.

An additional limitation of this study resulted from the proportion of returns from the opinionnaires mailed. Approximately seventy per cent of the total number of opinionnaires were returned. Similarly, this study was also limited since such data do not lend themselves to an experimental approach using refined statistical designs to verify its findings. The statistics were selected on the basis that they provided a valid means of ascertaining the relationships between the opinions of teacher educators, department of education officials, and industrial arts teachers regarding important issues in teacher education.

Finally, there were limitations brought about by comparing systems of teacher education in isolation from their political, economic, and social contexts.

Type and Method of Study

This status study was primarily a normative survey of existing practices regarding teacher preparation and teacher certification in the ten provinces of Canada. The information was obtained through a systematic search of available literature, interviews, and opinionnaires.

The method of descriptive analysis consisted of a careful review of bulletins, books, reports, and other documentary evidence and of the recording of data pertinent to the solution of the problem. This method was applied to the sources of information listed in the following section of this dissertation.

The interview was the second method employed for securing data using a structured technique. The procedure was to memorize the important items to be covered and to record the results at a later date as indications of contemporary thought in relation to teacher preparation theory and practice. This method was applied to officials of the Faculty of Education at the University of Manitoba and to others from the Manitoba Institute of Technology and the Department of Education.

An opinionnaire (included as Appendix) constituted the third method of obtaining relevant data. The opinionnaire dealt with important aspects of the education of industrial arts and general-subject teachers. This opinionnaire was sent to the various groups listed below; ie., groups vitally concerned with this particular educational problem in Canada. A discriminative analysis was done between the groups where there was an overall significant difference between the means using a one-way analysis of variance.

Sources of Information

Various sources of information were used in this study. The

methods outlined above were applied as appropriate to the following sources of information:

1. The Chester Fritz Library at the University of North Dakota
2. The Faculty of Education Library of the University of Manitoba
3. The Manitoba Department of Education Library
4. The Carnegie Library of Winnipeg, Canada
5. Industrial arts teachers of the provinces of Manitoba and Alberta
6. Teacher-educators of the various Canadian universities and institutes of technology
7. Officials of the Manitoba Department of Education
8. The Canadian Teachers' Federation and the Canadian Teachers' Association
9. The Dominion Bureau of Statistics

Indications of the most profitable literature among the library sources of information were located from a perusal of the Education Index and the Reader's Guide to Periodical Literature. Further help in locating such information was found in a recent bibliography of teacher education and certification compiled by the research division of the Canadian Teachers' Federation.[1]

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[1] "Teacher Education and Certification," A bibliography of recent research and writings (Research Divison, Canadian Teachers' Federation, March, 1966). (Mimeographed.)

Need and Purpose of the Study

A status study of this nature will be of immense importance at this time in the development of suitable educational programs for teachers in Canada generally and in the province of Manitoba specifically. This study attempted to identify areas of change and purposeful development in various provincial schemes of teacher preparation. Attempting to clarify the present overall provisions for teacher preparation and certification at this time allows future curriculum builders to plan more intelligently for all forms of teaching specialties, particularly industrial arts.

There seems to be no available study that systematically examines the multitude of programs available throughout Canada concerning teacher preparation and certification in this field. Neither have the implications present in the changed thought and practice regarding general teacher preparation been sufficiently aired to markedly affect industrial arts teacher education. At the present time the provinces of British Columbia, Alberta, Saskatchewan, and Manitoba have placed teacher education under the auspices of their respective universities. Manitoba, however, does not include industrial arts and vocational teacher-training at its university. Provision is also made in most other provinces for university credit for work taken for teacher certification purposes. Teacher preparation programs for industrial arts teachers conducted by provincial departments are often not acceptable for

university credit in the United States or Canada. Many industrial arts teachers, therefore, depend on the United States for their professional preparation where established degree programs in industrial arts education may be found.

The confusing plethora of teacher-education programs for industrial arts teachers in Manitoba can be seen by briefly examining the requirements for certification. Industrial arts teacher preparation for Manitoba is of two main kinds; namely, that provided by the provincial department of education and that under the combined authority of the University of Manitoba and the Manitoba Department of Education.

For prospective teachers wishing to qualify for teaching industrial arts in Manitoba, there are at least five possible paths towards teacher certification. Two of these paths are open for individuals with a grade twelve standing in the non-matriculation course and three are for those with a baccalaureate degree in arts or science. With this basic grade twelve entrance requirement the prospective teacher may:

1. Attend the Faculty of Education of the University of Manitoba for one year and obtain a clearance on professional training and internship before attending the industrial arts center, or

2. Enter the industrial arts center directly and take the two year full time teacher preparation program.

Those with a baccalaureate degree in arts or science may enter the Faculty of Education for the one year teacher preparation course. To qualify in this manner for an industrial arts teaching certificate the

individual may:

1. Enter a two-year full time industrial arts teacher preparation course at the Manitoba Institute of Technology,

2. Be issued a permit to teach industrial arts, or

3. Take a further year of teacher preparation for the Bachelor of Education degree.

Small wonder, therefore, when confronted with such a variety of certification programs, that many teachers have expressed the need for continued research in the problem of teacher education and certification in Canada. The wide variety of programs and standards that may be followed in obtaining the same teaching certificate is felt unnecessary and injurious to the eventual day when teaching becomes a "profession," particularly when the opportunity for professional standing is not equal for teachers of the various subject fields of general education.

CHAPTER II

REVIEW OF RELATED LITERATURE

In the search through the various library bibliographies and indices, most of the subject matter reviewed dealt with teacher education and certification, for Canada, in a limited fashion. Most accounts of teacher education were of a limited nature in that they dealt mainly with historical accounts of the growth and development of teacher education or of present conditions for general certification.

The following excerpts of past research were largely obtained from the various books, professional journals, and magazines listed in the Education Index and the Encyclopedia of Educational Research for the period extending from 1952 to 1966.

Agencies Controlling the Certification of Industrial Arts Teachers in the Various Provinces in Canada

Under the broad provisions of Section 93 of the British North American Act, 1867, and appropriate provincial statutes, authority for setting teacher qualifications and controlling teacher certification resides in the ten provincial legislatures. As a member of the provincial legislature and of the party in power, the minister of

education determines the educational policies of the government, including those pertaining to the preparation and certification of teachers.[1]

The minister of education, his deputy minister, and a staff of permanent employees constitute the "Department of Education." Through these departments of education the majority of provincial governments retain a centralized control over teacher education and certification. Apparently the ultimate powers reside with the minister, but in varying degrees, these powers may be delegated.[2]

In summation, it appears that the provincial governments, or agencies and organizations subject to the control of the provincial authorities, have these powers:

1. In Teacher Education
    a. To establish or designate the institutions accredited for the education of teachers
    b. To approve programs and specific courses for the preparation of teachers
2. In Teacher Certification
    a. To determine the types of teacher certification and the requirements for each class of certification[3]

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[1]Charles E. Phillips, The Development of Education in Canada (Toronto: W. J. Gage, 1957), p. 560.

[2]The Government of Canada (3rd. ed.; Toronto: University of Toronto Press, 1957), p. 284.

[3]Addresses and Proceedings of the Canadian Conference on Education, eds. George G. Croskery and Gerald Nason (Ottawa: Mutual Press, 1958), pp. 547-554.

Advisory Committees

Each province has at least one agency established by the state to function in an advisory role with respect to one or more of the following: teacher education, teacher certification, teacher selection, and the grading of applicants. The composition of these advisory committees is predominantly professional, with the chairman frequently being a department of education representative and civil servant. Arbitrary and unilateral action in the setting of standards for the teaching profession is thus becoming less frequent and standards are being established on the basis of consultation.

Influence of Teachers' Associations

With the exception of the French Catholic teachers in Quebec, teachers in each of the provinces are required to become members of their provincial organizations.

Teachers' organizations face many social, economic, and political barriers in their efforts to gain a measure of control over certification and the raising of professional standards. These barriers are caused by such problems as the inertia and apathy among members, the large proportion of married women, the growing pupil enrollments, and the teacher shortage.[1]

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[1] George G. Croskery, "The Role of Teachers' Organizations in Canada," Canadian Education, IX (September, 1956), pp. 59-64.

There seems to be a trend toward increased teacher participation in the establishment of certification standards; however, this must not be overstressed as information from all provinces still leads to the conclusion that provincial governments continue to exercise close and ultimate control over teaching certificates.[1]

The Requirements for Teacher Certification Throughout the Provinces

In the review of available data it was found that the policies and procedures in teacher education and certification in Canada are confusingly diverse and complex. The intricacies and almost infinite variety of these teacher preparation measures and regulations make the accuracy of any single investigation a matter of very dubious certainty.[2]

Ontario and Newfoundland appear to be the only provinces to issue teaching certificates after a one year teacher preparation program. Manitoba, Quebec (Protestant), Quebec (Catholic), New Brunswick, and Prince Edward Island have a minimum of two years preparation above junior matriculation for their first teaching certificates that can be made permanent. British Columbia, Alberta, and Nova Scotia require a three

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[1] "Canadian College of Teachers," ATA Magazine, XXXVIII, No. 6 (February, 1958), pp. 18-19.

[2] Donald Roy Cameron, Teacher Certification in Canada (Ottawa: Canadian Teachers' Federation, 1960).

year period beyond the junior matriculation level for the preparation of teachers. British Columbia and Newfoundland have a four year degree in education and all provinces appear to have a five year professional degree certification level. No consistency was noticed in the grade validity for the types of certificates issued, e.g., the Grade I certificate of Newfoundland issued after the one year program above junior matriculation entitles the holder to teach grades one to eleven, whereas the same grade validity in British Columbia required a four year education degree. Five year degree preparation programs or their equivalents appeared to be the general requirements for a "professional" certificate which allowed the holder to teach in the high school, particularly at the grades eleven, twelve, and thirteen levels.

According to the Canadian Teachers' Federation, there is a lack of formal research in special certification for teachers. The Registry of Canadian Theses in Education maintained by the Canadian Education Association lists no studies dealing with this subject. Every provincial system of teacher certification, however, has the following standards for special certification.[1]

Supplementary Certificates

These certificates are issued after an appropriate general teaching certificate signifying additional preparation in a special field of

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[1] Ibid.

study or service is acquired. The special certification is thus a supplementary qualification and frequently issued to persons deemed qualified to teach so-called non-academic subjects (e.g. Industrial Arts, Home Economics, and Business Education, etc.).

Restricted or Limited Certification

These are separate certificates for those who do not hold a general or basic certificate. Holders of such certificates are permitted to teach within the compass indicated on the certificate. There is a considerable number of subject fields included in these certificates but most frequently they are Business Education, Home Economics and Industrial Arts.

Provision for the Education of Industrial Arts Teachers in Provincial Departments of Education and Universities

The following data were secured from the report of several Manitoba members of the Canadian Association of School Superintendents and Inspectors.[1] This material will serve as a brief summary of the more recent research by the Canadian Teachers' Federation[2] and the detailed examination by the writer of material obtained from university calendars and departments of education.

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[1] Secondary Education in Canada, A Report prepared by several Manitoba members of the Canadian Association of School Superintendents and Inspectors (Toronto: Ryerson Press, 1964).

[2] "Basic Teaching Certificates in Canada," Prepared by the Research Division, Canadian Teachers' Federation (Ottawa, Ontario, April, 1966). (Mimeographed.)

In British Columbia the University of British Columbia offers a double major in industrial arts in a Bachelor of Education degree course. The technical phase of this course is conducted at the British Columbia Vocational School, Burnaby. An emergency training course of shorter duration is also given at the British Columbia Vocational School.

Alberta also has a Bachelor of Education program in industrial arts. A division of vocational education was set up in the University in 1962 with plans to offer a Bachelor of Education degree in vocational education as well as in industrial arts.

Saskatchewan provided for a major in industrial arts in a Bachelor of Education program starting in 1966.

Manitoba provides industrial arts teacher preparation at the Manitoba Institute of Technology. No programs for industrial arts are offered by the University of Manitoba at the present.

Ontario has programs for industrial arts teachers and vocational teachers conducted at the Ontario College of Education and the Ryerson Polytechnical Institute (in Toronto). To complete these programs, three years of study at the Ryerson Institute and an extra year at the Ontario College of Education are required.

Quebec provides most of the trades and other vocational teacher training in vocational institutions completely separated from the academic teacher preparation institutions of the University or Department of Education.

Until a few years ago New Brunswick and Nova Scotia provided courses of two years duration in industrial arts in the two provincial teachers' colleges. In New Brunswick the course was taught at the Technical Institute at Moncton.

Newfoundland has no provision for industrial arts teacher training. This province has very few teachers of this type and those that exist are prepared mostly at Truro Teachers' College in Nova Scotia.

CHAPTER III

THE RELATIONSHIP AND RESPONSIBILITY OF INDUSTRIAL ARTS TO GENERAL EDUCATION

Purposes and Methods of General Education

A current statement regarding the purposes of education originating from the Educational Policies Commission of the National Education Association is as follows:

> The central purpose of American education is the development of the ability to think. This is the central purpose to which the school must be oriented if it is to accomplish either its traditional tasks, or those newly accentuated by recent changes in the world . . . . In this context, therefore, the development of every student's rational powers must be recognized as centrally important.[1]

Though almost everyone would agree that education should concern itself centrally with the development of rationality there are somewhat different interpretations of the term "rationality." Dewey, for example, believed that the object of education was to alert youth to the crucial social issues and conditions operating in contemporary American society.[2]

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[1]Educational Policies Commission, The Central Purposes of American Education (Washington: National Education Association, 1961), pp. 11-12.

[2]John Dewey, "Education and Social Change," The Social Frontier (May, 1937), pp. 235-238.

His concept of rational powers would best be equated with intelligent action manifested in the processes of scientific inquiry. For Dewey, therefore, it would appear that the habits of attitude and action to be fostered in students would acknowledge the scientific and technological forces at work in society in addition to the more traditional subjects of the school.

Caswell points out that one of the basic considerations in American education is that all people must have an education which provides a balanced and interrelated emphasis on general or liberal objectives on the one hand and on vocational or professional objectives on the other. He goes on to say that there are still many attempts to divide students according to general or vocational needs.[1] The implications of such a division lie in the belief that the intellectually talented alone require a program of education that is "purely academic" while those destined for skilled and semi-skilled jobs should have programs of a largely vocational nature. The emphasis in education today for many educators would seem, therefore, to stress the development of the intellect through traditional and humanistic methods.

The exclusive emphasis upon the study of literature and languages for the large majority of American youth is to ignore such admonitions

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[1]Hollis L. Caswell, "Great Challenges for Education," Vital Issues in American Education, eds. Alice and Lester D. Crow (New York: Bantam Books, 1964), pp. 29-32.

as, "there must be a continual emergence within a culture of a creative element sensitive to the needs of the times and sufficiently resourceful to look for new approaches" and "the dynamics of the world precludes a fixity in the educational effort."[1]

According to Dewey, the origins and development of the mind occur in the activities of everday living through the process of problem solving.[2] He believed that the mind was not some supernatural force but an ability whose origin must be sought in the activities of man in controlling his environment. The experiences that best allow for the development of the intellect are not, therefore, restricted to those studies that have traditionally formed the classic view of education but are to be found in the less abstract studies of the curriculum. The activities of the fine and industrial arts laboratories, when properly planned, could, therefore, provide the necessary experiences conducive to the development of the intellect for an extremely large segment of the present student population. Throughout most of his work Dewey has expressed the idea of the unity of mind and body and of the reconstruction of experience as necessary ingredients in the development of the thinking

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[1]Arnold J. Toynbee, A Study of History, Abridgement of Volumes I-VI by D. C. Somervell (New York: Oxford University Press, 1955), p. 578.

[2]John Dewey, Logic: The Theory of Inquiry (New York: Henry Holt Company, 1938), pp. 29-30.

process.[1]

The prospect of being able to use more than one approach in the development of a student's rational powers is of great importance in a democratic society. The schools, as a part of society, are given the responsibility of educating the gifted and the slow learner alike so that they may become responsible citizens in meeting the social realities of a contemporary and highly technological world. Max F. Millikan suggests that, "one of the central goals of education . . . should be a rapid expansion in the capacities of people at all levels for problem-solving and for taking a rationally inventive approach to the issues confronting them."[2] According to Frandsen, "early American teachers trusted a few difficult subjects to discipline the mind so that people would . . . manage all sorts of activities, even unrelated activities, effectively."[3] Today there is more emphasis on the learning of generalizations of a broader scope because of their widespread transfer value. Bruner, for example, appears to subscribe to this non-specific form of transfer training as indicated in the following statement:

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[1]John Dewey, "The Reflex Arc Concept in Psychology," The Psychological Review, III (July, 1896), p. 358.

[2]Max F. Millikan, Education for Innovation (New York: Dodd, Mead, and Co., 1962), p. 134.

[3]Arden N. Frandsen, How Children Learn (New York: McGraw-Hill Book Company, Inc., 1957), p. 180.

> Teaching specific topics or skills without making clear their context in the broader structure of a field of knowledge makes it difficult for a student to generalize from what he has learned to what he will encounter later.[1]

One method of teaching that many educators consider of value in the building of meaningful and valid principles, attitudes, and concepts is active learning activities similar to those encountered outside the classroom. This emphasis on active experience is basic to Dewey's theory of education. These "experiences" should be rich in meaning so that significant elements may be abstracted to form worthy ideas and concepts.

The new programs in science of the Physical Science Study Committee, the Biological Sciences Curriculum Study, and the Chemical Bond Approach, along with the work in mathematics of the School Mathematics Study Group, are all attempts to provide more fully for student flexibility, ability, and creativity. These new programs all indicate the changed conditions in purpose and method of general education for the needs of today's youth.[2] The claim of industrial arts as a part of general education does not, however, have the work of national study groups and experimental programs to support it.

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[1]Jerome S. Bruner, The Process of Education (Cambridge, Mass.: Harvard University Press, 1963), p. 17.

[2]John I. Goodlad, School Curriculum Reform in the United States (New York: The Fund for the Advancement of Education, 1964), p. 77.

The Claim of Industrial Arts as Part of General Education

The schism between industrial arts and general education has had a long and involved historical past. General education studies traditionally have been viewed by many educators as being determined by the needs of the maturing individual, both in himself, and in relation to the society of which he is a part. According to Munk, however, all man's capacities have not been given equal consideration in education as the emphasis has been given to the development of human reason.[1] In fact, liberal education, according to Newman, is, "simply the cultivation of the intellect as such, and its object is nothing more or less than intellectual excellence."[2] It is, however, the purpose here to suggest that, properly conceived and taught, industrial arts does have an important and somewhat unique role to play in the education of the youth of Canada and of the United States--one that is not devoid of worthy intellectual study.

The current objectives in industrial arts education appear to have enough in common with those of general education to warrant a much closer examination of them and of their implications as claimants for general education status. The following list of objectives was the

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[1]Arthur W. Munk, A Synoptic Philosophy of Education (Nashville: Abingdon Press New York, 1965), p. 127.

[2]Cardinal John Henry Newman, On the Scope and Nature of University Education (London: J. M. Dent and Sons Ltd., 1955), p. 93.

result of a conference for improving industrial arts teaching held in June, 1960:

1. To develop in each student an insight and understanding of industry and its place in our culture

2. To discover and develop talents of students in the technical and applied sciences

3. To develop technical problem-solving skills related to materials and processes

4. To develop in each student a measure of skill in the use of the common tools and machines[1]

It is believed that an examination of each of these objectives in turn will reveal whether or not the claim of industrial arts as part of a general education is a tenable thesis. Implicit in the first objective is the suggestion that, regardless of future vocation, no student or individual in society can lay claim to being an "educated" person today unless he has some understanding of the industrial world. When the insight and understanding of industry is not limited to the learning and practicing of mechanical skills, the way is clear for deeper perspectives and a concern for man and his work. The emphasis for contemporary industrial arts education lies in uncovering the many underlying laws and principles of man's technological environment. Such technological knowledge and its concomitant social problems are, then, made matters of intelligent inquiry worthy of all future citizens.

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[1] Improving Industrial Arts Teaching, A Conference Report (U. S. Department of Health, Education and Welfare, June, 1960), pp. 19-20.

Woellner of the University of Chicago writes that an, "educated man today should be intellectually at home in his natural, social, industrial, and political environment."[1] The study of industrial arts serves a unique function in this regard due to its setting that so realistically approximates the industrial aspect of modern society.

The second objective deals with the discovery and development of students in the technical fields and applied sciences. Here too, when properly presented, industrial arts can provide intellectual, practical, creative, and expressive experiences worthy to stand alongside those of the more traditional offerings. The numerous examples throughout the world of man's knowledge and skill in using machines, tools, and processes bear mute witness of the potential of such abilities for him to express his most lofty ideas and ideals in a lasting and satisfying fashion. Today the student in industrial arts is more likely to be encouraged to identify a need in the problem-solving approach--one that can be met by using tools, materials, and processes common to industry. Yet the process is not one of copying existing plans and procedures, but one in which research into materials, design, purpose, and construction are vital features of the "project" being constructed. The "project" in the new outlook of industrial arts is no longer considered the reason for the learning experiences but an integral part of the

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[1] Robert C. Woellner, The Industrial Arts in General Education (Chicago: University of Chicago Press, 1941).

problem-solving method of learning whose function is to act as a focal point for the acquisition of deeper insights and more meaningful concepts in the technical fields and those of applied science. The development of these technical problem-solving skills is more explicitly stated by the third objective for industrial arts whereby students are expected to think in a creative fashion while utilizing the principles of science and mathematics.

The fourth objective for industrial arts is that of developing in each student a measure of skill in the use of common tools and machines. When the development of skill is approached with the view of allowing a more complete expression of a student's innermost desires and needs it can be equated with a general education. The claim of industrial arts as part of general education could hardly be justified, however, in a situation where skills were taught simply for a high degree of proficiency. In such a situation the type of education given would more closely resemble that of vocational training rather than of general education. Industrial arts education does, of course, offer pre-vocational experiences for those in need of a more practical curriculum. Unfortunately, the program offerings for the slow learner, the average student, and the gifted student have been known to be quite similar apart from the amounts of related information covered and the number of

"projects" required.[1]

It is believed, therefore, that the claim of industrial arts as part of general education is quite a defensible one, particularly when the implications that have been outlined in the preceding pages have been realized. The progress made in industrial arts teaching by the introduction of the unit method and individual research, along with problem research indicates the trend in implementing these changes. In the following chapters an examination of actual and proposed programs of industrial arts teacher education programs is made and compared with those for general subject teachers. The similarities and differences allow the reader to see more clearly the relationships between these teacher training programs and, in so doing, the interrelationships that exist between general and industrial arts teaching.

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[1]Maurice S. Vaughan, "Factors Influencing Industrial Arts Achievement for Slow Learner and Major Work Classes in Winnipeg, Manitoba" (An unpublished Master of Education Thesis, University of North Dakota, 1964), p. 117.

CHAPTER IV

PRESENTATION AND INTERPRETATION OF THE DATA

The results or findings of the various phases of this study are presented in this chapter. The following data were obtained from the sources named in Chapter I, and are presented in this order:

(a) The requirements for basic certification in general academic subjects in the various provinces of Canada

(b) The requirements for basic certification in the special subject of industrial arts in the various provinces of Canada

(c) The trends in general subject and industrial arts teacher education

(d) Industrial arts teacher education

(e) The comparison of the programs of certification and teacher preparation for Alberta and Manitoba

(f) Analysis of data obtained from teacher education and certification opinionnaire

The Requirements for Basic Certification in General Academic Subjects in the Various Provinces of Canada

An outline of the most common basic certificates for each province follows each descriptive account in this chapter. A detailed breakdown of the requirements and certificates is given in the Appendix.

British Columbia

Throughout the province of British Columbia the admission requirement for teacher education programs is junior matriculation. The first certificate that can be made permanent requires a minimum of three years training and is called the Elementary A (EA) certificate which is valid to teach grades one through eight. All of the teacher preparation programs in this area are under the auspices of the universities listed on the outline on page 37.

At the professional certification level there is a four year B.Ed. (Elementary) program and a five year B.Ed. (Secondary) program which qualifies an individual for either the Professional C or the Professional B teaching certificate respectively.

The work done at the teachers' colleges in British Columbia is given university credit. However, since 1956 teacher education has been a university responsibility with the department of education controlling the certification regulations.[1]

The teacher education program of Simon Fraser University is somewhat different from those of the other universities in British Columbia. It operates on a trimester system with three time intervals available in one calendar year. Completion of two of these intervals

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[1]Letter from Henry M. Evans, Registrar, Department of Education, Victoria, British Columbia, November 10, 1966.

corresponds to the usual university academic year.[1] According to the data provided by the previous source and an article written by Dr. A. R. MacKinnon, Dean of the Faculty of Education, at Simon Fraser University,[2] it appears that students wishing to qualify as teachers register first in the Faculties of Arts and Science. Forty-five semester hours are required before students are admitted to the Professional Development Program for the elementary schools and an additional seven semesters of work of the general course program for secondary teachers. The courses of the professional program are designed to aid a student in becoming more perceptive rather than more knowledgeable. Work in the faculty of education is taken in two stages with Stage I occupying one semester divided into two equal parts:

Stage I

(a) Introduction Period.--In the first period a team of four students work in a school with a teacher selected by the faculty and immediately plan lessons, teach, and evaluate themselves.

(b) Reading Period.--This consists of planned observations and reading in professional literature by means of seminars.

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[1] "Teacher Training Programs," Department of Education, Victoria, British Columbia, Circular, May, 1965. (Mimeographed.)

[2] A. R. MacKinnon, "Simon Fraser Intends to Train Teachers Differently," ATA Magazine, Vol. 57, No. 1 (October, 1965), pp. 37-40.

Stage II

This occurs during one semester where a student works in a teaching situation under supervision. In the other semester undergraduate courses are taken in the Arts and Sciences that are related to the student's professional growth.

Requirements for Teaching Certificates at Simon Fraser Interim Elementary B Certificate (At least 75 semester hours of approved work)

The program must include:

1. 45 semester hours of work in the Faculties of Arts, Science and Education, according to the requirements specified, with

   a. A minimum of 12 semester hours of work in the Department of English

   b. Six semester hours of work in the Department of History and, or, Geography

   c. Education 201-3 and 202-3

2. Professional Development Program: Stage I (15 semester hours of credit toward certification), plus

3. Professional Development Program: Stage II - this includes:

   a. One semester in a teaching situation

   b. One semester of course work at the university to the amount of 15 semester hours of credit

   c. An undergraduate seminar in education (curriculum)

Interim Elementary A Certificate (At least 90 semester hours of approved work)

1. Students may qualify for this certificate by completing:

   a. All of the courses and the professional development Stages I and II, required for Interim Elementary B Certificate (A total of 6 semesters), plus

   b. One additional semester, at least 15 semester hours of course work carrying credit towards the degree

2. Students who have qualified for the Interim Elementary B Certificate may qualify by completing one additional semester

Interim Professional C Certificate (At least 120 semester hours of approved work)

1. Students may qualify for this certificate by completing:

   a. All of the courses and the professional development program Stages I and II, plus

   b. Three additional semesters of course work towards a degree

2. Students who have qualified for the Interim Elementary B Certificate may qualify by completing three additional semesters

3. Students who have qualified for the Interim Elementary A Certificate may qualify by completing two additional semesters

Requirements for Teaching Certificates at the University of British Columbia and the University of Victoria

The respective faculties of education offer programs leading to an undergraduate degree in education in the fields of Elementary and

Secondary Teacher Education.[1]

Undergraduate Certificate and Degree Programs

1. In the Elementary teaching field

   a. A one year program for students with a full first-year program leading to the interim Elementary B Teaching Certificate

   b. A four year program leading to the degree of B.Ed. in the elementary field and the Professional C Teaching Certificate. The completion of the first two years of this program qualifies the student for the Elementary B Teaching Certificate

2. In the Secondary teaching field

   a. A five-year program leading to the B.Ed. degree in secondary teaching and the Professional Basic Teaching Certificate

   b. Elementary teachers with the Elementary B Certificate may qualify for the degree and the Professional Basic Certificate in the secondary by completing the remaining three years of the program

   c. A one-year program for graduates with an acceptable bachelor's degree

Alberta

Dean LaZerte, former Dean of Education at the University of Alberta, was quite correct in his forecast regarding the number of certificates that the province of Alberta would be issuing its teachers. In his book, written in 1947, he made note of the fact that after July 3, 1950,

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[1] Calendar of the Faculty of Education, University of British Columbia, 1966-1967.

TABLE 1

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
BRITISH COLUMBIA

Interim Certificate	Degree or Diploma	Admission Standards and Years of Training
Elementary A (EA)		Junior Matriculation plus three years of B.Ed. (Elementary) or Elementary B plus third year standing in education or second year arts or other approved faculty
Elementary B (EB)		Junior Matriculation plus two years of B.Ed. (Elementary)
Professional Basic (P.B)	B.Ed. (Sec)	Junior Matriculation plus B.Ed. (Secondary) or equivalent five-year degree standing of Junior Matriculation plus B.Ed. (Elementary) plus one additional year of study
Professional C (PC)	B.Ed. (Elem)	Junior Matriculation plus B.Ed. (Elementary) or Elementary B plus 4th, standing in education or 3rd year in arts or B.Ed. (Secondary) course, but with less than 60% in the major subjects
Junior Matriculation - Grade 12 Senior Matriculation - Grade 13		

there would be only three types of certificates issued in Alberta.[1]

The admission requirement for the teacher education programs in Alberta is completion of grade twelve. There are three basic certificates: (1) The Standard Elementary, (2) The Standard Secondary, and (3) The Professional.

According to Dr. H. T. Coutts, Dean, Faculty of Education, of the University of Alberta, the majority of Alberta teachers follow undergraduate B.Ed. degrees in which academic and professional studies are developed concurrently.[2] In 1945, the Minister of Education for Alberta gave the University of Alberta the responsibility for training teachers.[3]

The Standard E Certificate

1. A person who has completed the first two years of the B.Ed. program may be granted an interim Standard E Certificate

2. Before the Standard E Certificate may be made permanent, the holder:

   a. Must teach in Alberta for two years, and

   b. Must be recommended by a Superintendent or Inspector

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[1] M. LaZerte, Teacher Education in Canada (Toronto: Gage and Company, 1951), p. 12.

[2] H. T. Coutts, "Teacher Education Alberta Style," NTA Journal, Vol. 57, No. 3 (February, 1966).

[3] Letter from S. C. T. Clarke, Executive Secretary, The Alberta Teachers' Association, Edmonton, Alberta, October 13, 1965.

The Standard S Certificate

1. A person who has completed the first two years of the B.Ed. program may be granted an interim Standard S Certificate

2. The interim Standard S Certificate may be made permanent as in 2 above

The Professional Certificate

1. A person who has completed three years of the B.Ed. program may be granted an interim Professional Certificate

2. The interim Professional Certificate may be made permanent as in 2 for the Standard E Certificate[1]

Apparently students entering the Faculty of Education at the University of Alberta now take a "common first year." This means that during their first year of training, students pursue a general program consisting largely of arts and science courses, allowing them to explore their own interests and to acquaint themselves with the needs of the profession before becoming committed.[2]

Saskatchewan

The number of basic certificates for general academic subjects in Saskatchewan in two; namely, the Standard A and the Professional A.

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[1] Calendar of the Faculty of Education, University of Alberta, p. 45.

[2] Canadian Education and Research Digest, Vol. IV (June, 1964), pp. 82-83.

TABLE 2

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
ALBERTA

Interim Certificate	Degree or Diploma	Admission Standards and Years of Training
Standard E		Senior matriculation plus two years of B.Ed. program (elementary route)
Standard S		Senior matriculation plus two years of B.Ed. program (secondary route)
Professional	B.Ed.	Senior matriculation plus three years of B.Ed. program or degree plus one year training
Senior Matriculation - Grade 12		

Interim Standard A Certification

A person who has a Grade twelve standing and who completes a one-year teacher training program may be issued with the interim Standard A Certificate.

Standard A Certificate

The department of education may issue this certificate to an individual who:

1. Holds an interim Standard A and who has completed five acceptable university courses
2. Has taken two years of teacher training in the College of Education, University of Saskatchewan, or other accredited institution

Professional A Certificate

The department may issue a Professional A Certificate when the individual holds:

1. A B.Ed. degree from the University of Saskatchewan, or
2. An approved degree from Saskatchewan or other accredited university and has completed a one-year teacher training program[1]

Manitoba

There are two basic general academic certificates in Manitoba: the First Class Certificate and the Collegiate Certificate. Almost all

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[1]Policies and Regulations Governing Teachers' Certificates, Department of Education, Regina, Saskatchewan (May, 1965), pp. 4-5.

TABLE 3

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
SASKATCHEWAN

Interim Certificate	Degree or Diploma	Admission Standards and Years of Training
Interim Standard A		Senior matriculation and one year teacher training
Standard A		Senior matriculation and two years of teacher training
Professional A	B.Ed.	Senior matriculation and B.Ed. or degree and one-year teacher training
Senior Matriculation - Grade 12		

teacher education programs in Manitoba are now under the control of the university.[1] In-service, technical, vocational, and summer teacher training courses have not been included.

First Class Certificate

This is a one-year program beyond the entrance requirement of grade twelve. The Committee on Teacher Education for the province of Manitoba has recently made the recommendation that a two-year program be phased in for the fall of 1967.[2]

Collegiate Certificate

This program is also of a one-year duration taken after an initial undergraduate degree. An extra year of university study is required for the B.Ed. degree and may be achieved through one of the following patterns:

1. Three education courses plus two second or third year academic courses
2. Four education courses plus one second or third year academic course
3. Five education courses

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[1] Canadian Education and Research Digest, Vol. V (June, 1965), pp. 87-113.

[2] Report of the Committee on Teacher Education, Proposed Outline for a Two-Year Program of Pre-service Education for Teachers of Elementary Schools, Department of Education, Manitoba, November, 1966.

TABLE 4

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
MANITOBA

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
First Class		Senior matriculation and one year teacher training
Collegiate		University degree and one year teacher training or University degree and three summer sessions totalling 24 weeks
	B.Ed.	University degree and two years of teacher training
Senior Matriculation - Grade 12		

At the present time there are two main teacher training institutions in Manitoba: the University of Manitoba proper and its affiliated institution, Brandon College. In all likelihood, independent university status will shortly be granted to Brandon College and possibly to United College of Winnipeg.

Ontario

There are a number of teaching certificates at present in Ontario ranging from Second Class up through Standard IV for elementary school teachers and Types A and B Endorsed for high school teachers. In all there appear to be eight different levels of certification existing for teachers in the elementary and secondary schools for general academic subjects.[1]

Interim High School Assistant's Certificate Type B

This is the basic certificate valid in the secondary schools in Ontario. A pass bachelor's degree standing with a major in either one secondary school academic subject or in two related academic subjects are required for this certificate.[2]

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[1] "Basic Teaching Certificates in Canada," Prepared by the Research Division (Canadian Teachers' Federation, Ottawa, Ontario, April, 1966). (Mimeographed.)

[2] Althouse College of Education Bulletin, University of Western Ontario, 1966-1967, p. 13.

TABLE 5

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
ONTARIO

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
High School Assistant's Type B Endorsed		Senior matriculation plus a three year pass degree plus about one half year additional courses in major subject plus one year training or two summer courses at O.C.E.
High School Assistant's Type B		Senior matriculation plus three year pass degree plus one year training or two summer courses at O.C.E.
Elementary School Teachers' Cert. Standard I		Senior matriculation and one year training
Senior Matriculation - Grade 13		

Elementary School Teacher's Certificate Standard I

These courses are of a one-year duration and conducted by teachers' colleges throughout the province.

In the realm of teacher education the universities of Western Ontario, the University of Toronto, and the University of Ottawa concentrate on secondary teacher preparation while the teachers' colleges have responsibility for elementary teacher training.

Quebec (Protestant)

In Protestant Quebec there are two basic certificates and, in addition, a Superior Class I Diploma. The requirements for these licenses are as follows:

Class II Diploma

The program of study for this certificate takes two years to complete from a basic entrance requirement of grade eleven.

Class I Diploma

This is a four-year course which qualifies the student to receive a B.Ed. degree in addition to the Class I Diploma.

Superior Class I Diploma

An additional year of study beyond the Class I Diploma level entitles the student to receive an M.Ed. degree and the Superior Diploma.

TABLE 6

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
QUEBEC

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Protestant Quebec		
Superior Class I Diploma	M.Ed.	Class I Diploma plus a post-graduate degree requiring at least one year of training
Class I Diploma	B.Ed.	University degree plus one year teacher training or a four year B.Ed. program
Class II Diploma		Senior matriculation plus one year training or junior matriculation plus two year program
Catholic Quebec		
Diploma Class B		Grade 11 plus two year teacher training program
Diploma Class A		Grade 11 plus four year teacher training program
Senior Matriculation - Grade 12		

Quebec (Catholic)

The Diploma Class B

This is a basic certificate for elementary teachers in Catholic Quebec and is a two-year program conducted at provincial normal schools.

The Diploma Class A

A four-year program is required for this certificate.

New Brunswick

The first certificate from a total of six that can be made permanent is the Certificate I which is a valid license to teach general subjects for grades one to twelve.

Certificate I

This license requires two years of study at the New Brunswick Teachers' College or one year in addition to an initial second year of Arts, Science, or Commerce standing.

Certificate IV

Elementary teachers require two to three years study in addition to that needed for the Certificate I for the Certificate IV. This certificate carries with it either a Baccalaureat d'enseignement (B.E) degree if taken at the Universite' de Moncton or a Bachelor of Teaching degree

TABLE 7

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
NEW BRUNSWICK

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Teacher's License and Certificate I		Junior matriculation plus Teacher's License (old one year course) plus five university courses or ten summer courses at Teachers' College or Junior matriculation plus two year course at Teachers' College
Certificate IV	B.E or B.T (Elem)	Teacher's License plus four year university degree, or Bachelor of Teaching, or Bachelor of Elementary Education
Certificate V	B.Ed.	Teacher's License plus four year university degree plus B.Ed. or post-graduate degree
Senior Matriculation - Grade 12		

(B.T. Elementary) if taken at the University of New Brunswick.

Certificate V

The B.Ed. degree and Certificate V are granted after a one-year teacher preparation course beyond the B.A., B.Sc., or B.Sc.Com.

Nova Scotia

Teacher's License Class I

This is one of the basic certificates in Nova Scotia and requires one year of professional training from a base of the second year of university.

Professional Class III

Senior matriculation and three years of university work are required in addition to the one year of professional work for this certificate.

Professional Class II

A basic degree in Arts, Science, or Commerce is needed before embarking on this one-year course of professional study.

Prince Edward Island[1]

Certificate I

Students who complete the two-year professional course receive

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[1] Teacher Training and Licensing, Department of Education, Charlottetown, Prince Edward Island, p. 3.

TABLE 8

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
NOVA SCOTIA AND PRINCE EDWARD ISLAND

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Nova Scotia		
Teacher's License Class I	Junior Diploma in Education	Senior matriculation plus two years of university (academic) plus one year of professional study
Professional Cert. Class III	Senior Diploma in Education	Senior matriculation plus three years of university (academic) plus one year of professional study
Professional Cert. Class II	B.Ed.	B.A., B.Sc., or B.Comm. plus one year professional (B.Ed., or equivalent)
Senior Matriculation - Grade 12		
Prince Edward Island		
Certificate I		Junior matriculation plus two years academic and professional (Six academic and four professional courses)
Certificate IV	B.Ed.	Junior matriculation plus four years academic plus five professional courses.
Senior Matriculation - Grade 13		

this form of certificate to teach in Prince Edward Island.

Certificate IV

This is the degree program leading to a B.Ed. standing. Altogether, there are six grades of certificates available in this province.

Newfoundland

In addition to an emergency supply certificate, probationer's license and an A license, there are seven grades of teaching certificates in Newfoundland.

Grade I Certificate

A Board of Examiners may grant a Grade I Certificate to a candidate who has:

1. Successfully completed the first year of an approved course of study at a recognized institution;
2. Successfully completed the first year of a degree course and one-half year's training at a recognized Normal School;
3. Successfully completed a Normal School course of one year; or
4. Successfully completed three years of a degree course but with no education credits[1]

Grade IV Certificate

This is a four-year course which qualifies a candidate for the B.A. (Ed.) degree and the Grade IV Certificate.

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[1]The Teacher (Grading) Regulations, 1958, Department of Education, St. John's, Newfoundland.

TABLE 9

BASIC TEACHING CERTIFICATES FOR GENERAL ACADEMIC SUBJECTS
NEWFOUNDLAND

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Grade I Certificate		Junior matriculation plus one year university (academic and professional), or one year university (including one education course), and one year normal school
Grade IV Certificate	B.A. (Educ)	Junior matriculation plus four years university plus one year professional, or B.A. in education

The Requirements for Basic Certification in the Special Subject of Industrial Arts in the Various Provinces of Canada

British Columbia

Industrial arts teacher training is under university control in British Columbia.[1]

Elementary Basic (E.B.) Industrial Education Certificate

An individual requires twelve courses beyond the junior matriculation level. These courses apply towards the B.Ed. degree (Secondary) with a double major in industrial arts.

Professional Basic (P.B.) Certificate

This is a degree program of five-years duration leading to a B.Ed. degree with a double major in industrial education.

Alberta

The Department of Industrial Education of the University of Alberta is responsible for the training of industrial arts teachers.[2]

Professional Certificate

This program is four years in length and qualifies the student for the B.Ed. degree in industrial arts.

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[1] University of British Columbia Calendar, Faculty of Education, 1966-1967.

[2] Personal letter from Mr. J. D. Harder, Supervisor of Industrial Arts, Department of Education, Alberta, November 16, 1965.

TABLE 10

BASIC TEACHING CERTIFICATES FOR INDUSTRIAL ARTS
BRITISH COLUMBIA AND ALBERTA

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
British Columbia		
Elementary Basic Industrial Arts		Junior matriculation plus twelve courses (36 units) toward B.Ed. (Sec) double major in Industrial Arts
Professional Basic	B.Ed.	Junior matriculation plus five year B.Ed. program
Senior Matriculation - Grade 13		
Alberta		
Professional	B.Ed.	Grade 12 plus a four year Bachelor of Education
Senior Matriculation - Grade 12		

Saskatchewan

Up to two years ago the province of Saskatchewan limited its formal teacher training in the industrial arts and vocational areas to a few summer school classes in Saskatchewan.[1] There is now an approved university-based program for preparing industrial arts teachers which carries a B.Ed. degree majoring in industrial arts.[2]

Standard B Certificate

This is a two-year program. One year of industrial arts and one year of professional study are required. These two years can be applied towards credit for the four-year B.Ed. degree in industrial arts.

Professional A Certificate

This is a four-year program of teacher training that leads to a B.Ed. degree. A Professional A Certificate may be issued to a person who holds "A Bachelor of Education from the University of Saskatchewan or an approved degree in Education from an accredited university; . . .[3]

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[1]Personal letter from Mr. Ruben Richert, Executive Assistant, Saskatchewan Teachers' Federation, October 6, 1965.

[2]Canadian Education and Research Digest, Vol. III, No. 2 (June, 1963), p. 78.

[3]Brochure of the University of Saskatchewan, College of Education, Saskatchewan, 1966.

Manitoba

Teacher education programs for industrial arts teachers in Manitoba are, at present, of two-years duration. These courses lead to an interim special certificate in industrial arts.

Interim Special Certificate in Industrial Arts

This certificate requires two years of preparation following an entrance requirement of grade twelve. These courses occur in two sessions of ten months each and are held at the Manitoba Institute of Technology.

Permanent Special Certificate in Industrial Arts

In addition to the requirements for the interim industrial arts certificate an individual must complete two years of successful teaching, take further professional training, and receive the recommendation of the supervisor of shop courses.[1]

Ontario

There are no university courses leading towards degree standing for industrial arts teachers in Ontario. The three basic certificates are: the Elementary, the Intermediate, and the Specialist. The majority of industrial arts teachers in Ontario hold the basic general academic

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[1]Department of Education, Manitoba, Qualifications for Interim and Permanent Special Certificates in Industrial Arts, July, 1965.

TABLE 11

BASIC TEACHING CERTIFICATES FOR INDUSTRIAL ARTS
SASKATCHEWAN AND MANITOBA

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Saskatchewan		
Professional A	B.Ed.	Grade twelve plus four year B.Ed. program
Standard B		Grade twelve plus two years of the B.Ed. program
Senior Matriculation - Grade 12		
Manitoba		
Special Cert. Industrial Arts		Grade twelve Teachers' College Entrance plus two years of preparation in four areas of industrial arts
Senior Matriculation - Grade 12		

teaching certificate, the Elementary School Teacher's Certificate.[1]

Elementary Industrial Arts Certificate

Two department of education courses of five-weeks duration are needed for this certificate in addition to the basic teaching certificate mentioned previously.

Intermediate Industrial Arts Certificate

This certificate requires that the first summer course of the elementary industrial arts certificate course plus one intramural year at the Ontario College of Education be completed.

Specialist Industrial Arts Certificate

An individual must first be in possession of the intermediate certificate and have had one year of successful teaching. One intramural year at the Ontario College of Education is needed to complete this particular program.[2]

Quebec (Protestant)

There are three classes of diploma for industrial arts teachers in this portion of Quebec.

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[1]Personal letter from Professor R. D. Phillips, Director of Vocational Teacher Education, Ontario College of Education, University of Toronto, October 8, 1965.

[2]Ontario College of Education, Industrial Arts Courses, 1966.

TABLE 12

BASIC TEACHING CERTIFICATES FOR INDUSTRIAL ARTS
ONTARIO AND QUEBEC (PROTESTANT)

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Ontario		
Elementary Industrial Arts		Elementary School Teacher's Certificate plus two five-week department of education courses
Intermediate Industrial Arts		Elementary School Teacher's Certificate plus one summer course in industrial arts plus one year at the Ontario College of Education
Specialist Industrial Arts		Intermediate Certificate plus one year of teaching plus one year at the Ontario College of Education
Senior Matriculation - Grade 13		
Quebec Protestant		
Class III	Diploma	Junior matriculation plus training in technical work plus four summer schools
Class II	Diploma	Class II Diploma (General) plus 550 hours of professional courses and technical courses in shopwork.
Class I	Diploma	Class II Diploma (Indrustrial Arts) plus an approved degree
Senior Matriculation - Grade 12		

Class III Diploma (Industrial Arts)

Admission to this diploma course is junior matriculation and previous training in technical work. In order to complete the requirements of this teacher preparation program a period of professional study is necessary. The professional phase of this program usually takes four summer schools to complete.

Class II Diploma (Industrial Arts)

There are a variety of means by which an individual may qualify for this teaching license. Basic to them all appears to be a full senior matriculation and over five hundred hours of professional courses and technical courses in shop work.

Class I Diploma (Industrial Arts)

A Class II diploma plus a degree from an approved university are the requirements to complete this program of teacher preparation.

Quebec (Catholic)

The province of Quebec has a Technical Teachers' College in Montreal that is responsible for the proper training of teachers of vocational and technical subjects. There are three programs available in this "Ecole Normale De L'Enseignement Technique."

Diploma I

This is a one-year program aimed at training teachers for what is

called "initiation to work," which is equivalent to vocational teaching to students not able to go beyond grade seven in the academic course. The preparation is mostly in pedagogy consisting of 30 credits in such studies as psychological foundations and teaching techniques.

Diploma II

Candidates for this certificate have to complete a two-year program and have to be technicians to start with. They receive one year of pedagogy and then specialize for one more year in one trade.

Diploma III

The length of preparation for this diploma is three years and is designed to prepare teachers at the post-secondary level. One year is devoted to pedagogy and two years to applied sciences. Thirty credits of the total of ninety are to be earned in each of the following:

1. Pedagogical studies
2. Technological theory
3. Technological practice[1]

New Brunswick

Entrance requirements to the two-year industrial arts teacher program of the New Brunswick Technical Institute is completion of grade twelve.

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[1] Specialist Teachers, Provisional Prospectus, Minister of Education, Government of Quebec, 1967-1968.

TABLE 13

BASIC TEACHING CERTIFICATES FOR INDUSTRIAL ARTS
QUEBEC (CATHOLIC) AND NEW BRUNSWICK

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Quebec (Catholic)		
Diploma I		Grade 13 or Diploma of Technical Institute plus one year training
Diploma II		Grade 13 or Diploma of Technical Institute plus one year training in pedagogy plus one year special trade
Diploma III		Grade 13 or Diploma of Technical Institute plus one year training in pedagogy plus two years applied science
Senior Matriculation - Grade 12		
New Brunswick		
Teacher's License and Certificate I Vocational		High school graduation plus tradesman qualifications plus one year teacher training course
Teacher's License and Certificate IV Vocational	B.T (Industrial)	High school graduation plus four year university program
Senior Matriculation - Grade 13		

Teacher's License and Vocational Certificate I

Two years of study are needed to qualify for these certificates which are acceptable also for credit towards the Bachelor of Teaching degree.

Teacher's License Vocational and Certificate IV

The degree awarded at the University of New Brunswick for this four-year program is the Bachelor of Teaching (Industrial) and the Bachelor of Education for Industrial Arts at the University of Moncton.

Nova Scotia

The only provision for industrial arts teacher education and licensing is a two-year course at the Nova Scotia Teacher's College.[1]

Teacher's License Class I

Apparently licensing regulations are in the process of revision and in all likelihood the terminology will be changed to Teaching Certificate III which represents three years of study beyond grade eleven.

Professional Certificate I

This license classification can occur when an individual has a basic four-year degree in arts or science and the two years of professional training. Provision is made for raising the initial license

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[1]Personal letter from Mr. G. R. Sutherland, Inspector of Industrial Arts, Department of Education, Nova Scotia, October 19, 1965.

four additional classifications through attendance at summer schools until the professional certificate level is reached.[1]

Prince Edward Island

In granting special teacher's certificates, the Department of Education for Prince Edward Island has stated that anyone of the classification of teachers' certificates may be designated as "Special."[2]

Certificate I (Special) Industrial Arts

The length of the course at the two institutions preparing teachers in Prince Edward Island is two years.

Certificate IV (Special) Industrial Arts

One intramural year and one summer session in addition to an original undergraduate degree is required for this certificate.

Newfoundland

There is no provision for industrial arts teacher training in this province.[3]

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[1]Personal letter from Mr. Tom Parker, Executive Secretary, Nova Scotia Teachers Union, October, 1965.

[2]Teacher Training and Licensing, Department of Education, Charlottetown, Prince Edward Island, p. 4.

[3]Personal letter from Mr. N. Ray Wight, Secretary-Treasurer, Newfoundland Teachers' Association, October 7, 1965.

TABLE 14

BASIC TEACHING CERTIFICATES FOR INDUSTRIAL ARTS
NOVA SCOTIA, PRINCE EDWARD ISLAND, NEWFOUNDLAND

Interim Certification	Degree or Diploma	Admission Standards and Years of Training
Nova Scotia		
Teacher's License Class I		Senior matriculation plus two year course at teachers' college for industrial arts
Professional Cert. I		Undergraduate degree plus two year course of professional study
Senior Matriculation - Grade 12		
Prince Edward Island		
Certificate I Industrial Arts		Two year course similar to those for general certification but professional courses must be in subject field
Certificate IV Industrial Arts		Undergraduate degree plus one intramural year program plus one summer session
Senior Matriculation - Grade 13		
Newfoundland		There is no provision for industrial arts teacher training in this province.

The Comparison of the Academic, Professional, and Specialized Phases of Teacher Preparation Programs

British Columbia

There is an emergency program for the training of industrial arts teachers consisting of thirty-six units of study conducted for a period of fourteen months. Candidates completing these requirements are required, however, to complete the B.Ed. degree (Secondary) requirements through attendance at subsequent summer sessions in order to be fully qualified.[1]

The Bachelor of Education (Secondary) Degree Program

This is the standard program designed for the training of secondary teachers. It consists of 78 units. Every student is required to major in two subjects ordinarily taught in high school or to take an Honors Course in one such subject. In each major, in addition to prerequisite courses, at least 15 units must be taken.

The degree of Bachelor of Education (B.Ed.) Secondary with a double major in Industrial Education is typical of the teacher preparation programs available in British Columbia.

A double major in Industrial Education is constituted as follows:

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[1] Programs for the Preparation of Industrial Education Teachers, Technical Branch, Department of Education, IE-30, British Columbia, Rev. March, 1965.

1. 21 units of Academic courses which must include English 100, English 200, and English 303

2. 24 units of Education courses are required of all candidates for the B.Ed. degree (Secondary)

3. 33 units of Technical courses consisting of 27 constant units and 6 elective units[1]

This five-year program is broken down into the following series of courses and credits: (Note: One unit of study is the equivalent of two semester hours.)

First Year

	Units
English 100	3
History or Geography	3
Physical	3
Maths.	3
Electives	3
	15

Second Year (At the Division of Industrial Education)

	Units
Education 230 Electricity in Industrial Education	3
Education 252 Principles of Technical Drawing	3
Education 350 Technology of Woodworking.	3
Education 351 Technology in Metalworking	3
Education 353 Design in Industrial Education	3
Education 360 Power Mechanics	3
	18

Third Year (At the Division of Industrial Education)

Technical courses in one of the following areas of speciality:

a) Construction
b) Electricity-Electronics
or c) Metalwork-Mechanics 9

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[1] University of British Columbia Calendar, Faculty of Education, 1966-1967.

Fourth Year

	Units
English 200	3
English 303	3
Education 301 Introduction to Learning	3
Education. One Additional Course	3
	15

Fifth Year

Education 400 Philosophy of Education	3
Education 404 Curriculum and Instruction	3
Education 435 Introduction to the Study of Individuals and Groups	1 1/2
Education 410 The British Columbia School System	1 1/2

Plus two courses from the following:

Education 401 Theoretical Bases of Educational Psychology
Education 407 Introduction to the Study of Exceptional Children
Education 408 Teaching the Mentally Superior
Education 411 Foundations of Vocational Planning
Education 412 Introduction to Adult Education
Education 414 Audio-Visual Education
Education 415 Developmental Reading
Education 416 Speech Education
Education 417 Educating the Slow Learner and the Emotionally Handicapped
Education 430 History of Education
Education 460 An Introduction to Educational Administration
Education 461 Educational Diagnosis and Remedial Instruction
Education 470 Educational Sociology

Education 490 Book Selection and Evaluation	6
	15

Alberta

A comparison between the standard secondary B.Ed. route and that of the basic bachelor of education in industrial arts will allow the reader a clear understanding of the differences, in terms of the academic, professional, and specialized phases, of the two types of

preparation programs.

Standard Secondary B.Ed. Route (Each course equal to 6 credits)

First Year

1. Ed. Foundations 201. Introduction to Education, and
   Ed. Administration 261. The Role of the Teacher
2. Ed. Psychology 276. Introduction to Educational Psychology
3. English 200 or 210
4. Major
5. Approved Arts or Science option
6. Physical Education 218 (men)

Second Year

1. Approved Social Science or History
2. Curriculum and Instruction (Major Field)
3. Ed. Curriculum and Instruction 250. Student Teaching in the Secondary School
4. Major
5. Major or Arts or Science option

Third Year

1. Ed. Psychology 476. Educational Psychology
2. Philosophy 240 or Philosophy 242
3. Senior Education Option
4. Major
5. Major or Arts or Science Option

Fourth Year

1. Ed. Foundations 492. Philosophy of Education
2. Senior Education Option
3. Major
4. Major or Arts or Science Option
5. Major or Arts or Science Option

126 credits

Basic Bachelor of Education in Industrial Arts Program

First Year

1. Ed. IA 203. Introduction to Industrial Arts
   Ed. Administration 261. The Role of the Teacher
2. Ed. Psychology 276. Introduction to Educational Psychology
3. English 210
4. Approved Mathematics course
5. Ed. IA 260. General Industrial Arts
6. Physical Education 218

Second Year

1. Approved Chemistry course
2. Ed. CI 250. Student Teaching in the Secondary School
3. Approved Physics course
4. Approved Social Science course
5. Ed. IA 270. Introduction to Technology

Third Year

1. Ed. Psychology 476. Educational Psychology
2. Philosophy 240 or 242
3. Approved Arts or Science Option
4. Ed. IA 360. Laboratory of Technology
5. Ed. IA 370. Technology I (Computer and electricity-electronics technologies)

Fourth Year

1. Ed. Foundations 492. Philosophy of Education
2. Approved Social Science course
3. Ed. IA 350. Educational Programs and Practices in Industry and Labor
4. Ed. IA 460. Technology II (Materials and processes and power technologies)
5. Ed. IA 470. Technology III (Graphic communications and mechanical technologies)[1]

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[1] University of Alberta Calendar, Faculty of Education, 1965-66.

Saskatchewan

There is a two-year course for general subject teachers leading to the Standard A certificate and a continuous four-year course for secondary teachers. Candidates for the B.Ed. program (General Subjects) must first enroll for one year in the faculty of Arts or Science. They are then eligible to transfer to the secondary program. The curriculum of the four-year training program for students with no previous teacher training is as follows:

Academic

1. English 102
2. Economics 101 or Political Science 101
3. History 102 or M 102
4. A Science
5. A Second Language
6. Mathematics or Geography
7. Seven electives made up of three in a minor teaching field and four courses in a major teaching field
8. One elective which must be a senior class

Professional

First Year

1. Education 110. Growth and Learning
2. Education 164C. Physical Education (no credit)
3. Speech training

Second Year

1. Education 310. Educational Psychology

Third Year

1. Education 320. Introduction to Educational Administration

Third Year (cont.)

2. Education 379 A or B. Methods of Teaching in the Secondary School (Half Course)
3. Education 401. Foundation of Education

Fourth Year

1. Education 474B. Technological Aids to Teaching
2. One full course or two half courses in Methods
3. One education elective[1]

The first two years of this degree program constitute the requirements for the Standard A certificate (General Subjects). There is a two-year course in industrial arts that qualifies a student for a Standard B certificate in industrial arts. The industrial arts teachers require a journeyman's certificate or a diploma in technology in addition to the two-year training program. There is very little difference in the outlines of course requirements between the general program for secondary teachers and that for industrial arts. The major difference appears to be in labelling five of the seven electives required for the academic portion of the general program as the "Technical Component."

The Bachelor of Education, majoring in Industrial Arts has the following components:

Technical Component (10 Months at the Institute of Applied Arts and Science in Saskatoon)

1. Education 170. Materials and Processes I (Wood and Plastics)

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[1] University of Saskatchewan, General Calendar, 1966-1967, G. 16.

Bachelor of Education (cont.)

2. Education 171. Materials and Processes II (Metals, including foundry processes)
3. Education 172. Materials and Processes III (Graphics, including drafting and blueprint reading)
4. Education 173. Energy and Power I (Mechanical)
5. Education 174. Energy and Power II (Electrical-Electronics)

Academic

1. English 102
2. A Social Science
3. Mathematics
4. A Physical Science
5. One Arts and Science Elective
6. Two senior academic classes in a subject commonly taught in secondary schools

Professional

1. Education 110. Human Growth and Development
2. Education 270. Foundations of Vocational Educational and Industrial Arts
3. Education 271. Curriculum and Instruction in Industrial Arts and Vocational Education
4. Education 272. Communications in Business and Industry
5. Education 277. Teaching Methods
6. Education 310. Educational Psychology
7. Education 401. Foundations of Education
8. One approved education elective[1]

Manitoba

At the present time there is a one-year preparation program and a

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[1]The University of Saskatchewan, College of Education, Programs Leading to the Bachelor of Education Degree for Teachers in Vocational Education and Industrial Arts, 1966.

two-year course for general subject teachers at the University of Manitoba.

Education IA Certification Program

This program takes the place of the previous one-year program of the Manitoba's Teachers College.

Education I Certification Program

This is identical to the IA program apart from the entrance requirement of a complete second year of arts or science instead of the grade twelve for the former certificate.

General Outline of Courses for Certification Programs (Secondary)

Required

1. 400 History and Philosophy of Education
2. 401 School Administration
3. 420 Educational Psychology
4. 422 Practice Teaching

Method Options for Secondary Teaching (Minimum of 2 and a maximum of 3 half courses)

1. 423 English
2. 424 Social Studies
3. 425 Mathematics
4. 426 Science
5. 427 French
6. 428 Latin
7. 429 German
8. 430 Art
9. 431 Music
10. 432 Home Economics

Method Options for Secondary Teaching (cont.)

11. 433 Physical Education
12. 434 Commercial Subjects

Electives (Minimum of one full course and maximum of three half courses)

1. 435 Introduction to Guidance
2. 436 Psychology of Exceptional Development
3. 437 Rhetoric for Teachers
4. 438 Comparative Grammar and Applied Linguistics
5. 439 Special Topics in Mathematics
6. 440 Special Topics in Geography
7. 441 Special Topics in History
8. 442 P.S.S.C. Physics
9. 443 CHEM Study
10. 444 B.S.C.S. Biology
11. 445 French for Bilingual Students
12. 446 Drama in the Secondary School
13. 447 Audio-Visual Education

Education II - Bachelor of Education and Bachelor of Pedagogy (Professional Certification Program)

Entrance requirements for B. Paed program is five second or third year subjects in arts or science.

Requirements for B.Ed. and B.Paed.

1. Three education courses and two second or third year academic courses, or

2. Four education courses and one second or third year academic course, or

3. Five education courses[1]

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[1] University of Manitoba General Calendar, 1966-1967, pp. 375-388.

The present two-year preparation program for industrial arts teachers in Manitoba consists of the following courses.[1]

First Year

	Clock Hours
Drafting I	180
Metalwork I	180
Graphic Arts I	180
Woodwork I	180
Methods of Teaching Industrial Subjects	50
School and Industrial Safety	40
Educational Psychology	60
Testing and Evaluation	40
Student Teaching	120
Communication Skills I	100
General Science	100
	1230

Second Year

	Clock Hours
Plastics I	180
Electricity and Electronics I	180
Power Mechanics I	180
Drafting II	90
Option	90
Planning Industrial Education Facilities	50
Maintaining Industrial Education Facilities	40
Instructional Aids in Industrial Education	40
Principles of Vocational Education	60
Course Construction	50
Student Teaching	120
Communication Skills II	100
First Aid	20
	1200

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[1]Manitoba Institute of Technology, Curriculum in Industrial Arts, Teacher Training, 1967.

Ontario

The High School Assistant's Certificate Type B is the first professional certificate level for high school teachers in Ontario. Admission requirements are an initial undergraduate degree with a minimum of 21 credits in at least two teaching areas in the secondary curriculum.

Professional Courses

Required

1. Psychology and Sociology
2. History of Education
3. Philosophy
4. Professional Practice and Administration

Principles and Procedures of Teaching

Basic requirements are two methodology options with an opportunity to take one extra option in a field of special interest to the student. Methodology is offered in the following subjects:

Biology
Chemistry
Economics
English
French
Geology
German
Greek
History
Latin
Mathematics
Physics
Political Science
Psychology and Sociology
Spanish

In Ontario no method at present exists for an industrial arts teacher to convert any of his industrial arts courses into credit towards

any degree.[1]

The elementary industrial arts certificate is obtained after completing two department of education summer courses each of five weeks duration. This certificate qualifies the holder to teach part time industrial arts in an elementary school up to grade eight.[2]

Intermediate Industrial Arts Certificate

In addition to the requirements of a basic teaching certificate and an elementary industrial arts certificate there is an eight-month course in the following subjects:

1. General Woodwork
2. General Metalwork
3. Drafting and Blueprint Reading
4. Power Mechanics
5. Practical Electricity
6. History of Industrial Arts
7. Guidance
8. Observation and Practice Teaching

Specialist Industrial Arts Certificate

One extra intramural year at the Ontario College of Education beyond the Intermediate.

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[1] Personal letter from Professor A. W. Frizzell, Ontario College of Education, September 26, 1966.

[2] Ontario College of Education, Department of Vocational and Industrial Arts Teacher-Education, Industrial Arts Courses for Teachers, October, 1965.

Quebec (Protestant)

At McGill University the four-year B.Ed. program qualifies the student for an interim Class I Diploma which is a teaching license to teach at any level of elementary or high school. The first two years of the course are given at Macdonald College.[1]

Class I Diploma

First Year

1. English 100
2. French 100
3. Education 110. Orientation to Teaching
4. Mathematics 110 or 112 or Latin 1 or 100
5. One subject from each of two of the following:

    a. Biology 120, Music 5 or 100, or Fine Arts 100
    b. Physics 112, or History 100
    c. Geography 111 or Chemistry 110

Second Year

1. Psychology 21
2. Sociology 210
3. Education 220. Student Teaching
4. Education 230 or 231. Curriculum and Instruction in Reading
5. Education 212. The Child and the Curriculum
6. One subject from each of 3 groups:

    a. English 200 or 227
    b. Botony 210b (half course) and Zoology 230a
    c. Mathematics 224 or Latin 2 or 200
    d. Physics 222 or History 206 or History 210
    e. Geography 212 or Chemistry 220
    f. French 200
    g. Music 201

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[1] McGill University General Calendar, Quebec, 1966.

Third Year

1. Third Year Psychology Course
2. Third Year Sociology Course
3. Education 320. Student Teaching
4. Education 340-342. Curriculum and Instruction
5. Three courses in one or two continuation subjects
6. One Option

Fourth Year

1. Education 406. Educational Psychology
2. Education 407. History of Educational Thought
3. Education 420. Internship
4. Education 443. Curriculum and Instruction in one continuation subject
5. Three courses in one continuation subject

Interim Class I Diploma (Industrial Arts)

This form of certification is issued after completing four summer schools and 550 hours of professional courses and technical courses in shopwork. The specific breakdown of courses, hours, etc., was not available at the time of publication.

Quebec (Catholic)

The nature of the general subject teachers' program was not available apart from the length of the course and the entrance requirements. For the industrial arts or technical teachers, there is a three-year program leading to a Diploma III standing, a two-year program for the Diploma II and a one-year training period for Diploma I.[1]

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[1] Technical Teachers' College, Quebec, Program of Studies, 1966.

Diploma I

This requires one year of pedagogy after grade twelve entrance. There are 30 credits of work to be completed comprising of 777 clock hours of theory and practical work plus practice teaching.

Diploma II

For this diploma there are 65 credits of work to be completed; thirty of which are pedagogical and thirty-five credits (600-800 hours) in the area of a special trade. Here six tri-mesters or two years of study are required.

Diploma III

The difference between this diploma and those that precede it lies in the amount of time allocated to the study of a particular technology. Thirty credits made up of 740 clock hours of study and 60 credits or 1130 hours make up the 90 semester hours for this diploma.

The caliber of the courses and the length of the training period for the Diploma appeared, at first, to be similar to a number of the four-year undergraduate degree programs in industrial arts teacher education. However, this program is really to train future teachers at the post-secondary level or at the institute of technology level.[1]

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[1]Personal letter from Mr. Paul E. Larose, Director-General of Technical and Vocational Education, Department of Education, Province of Quebec, December 14, 1965.

New Brunswick

A Bachelor of Teaching (B.T.) degree is available at the University of New Brunswick for elementary, commercial, home economics, and industrial arts teachers. This degree and Certificate IV are awarded after the successful completion of a two to three-year program in addition to an initial department of education teacher training program of two-years' duration.

Certificate IV

Bachelor of Teaching (Elementary) Program

Two of the following:

1. History 1000
2. Classics 1000 or 2000
3. Biology 1000
4. Geology 1000
5. Philosophy 2000
6. Economics 2000
7. Political Science 2000
8. Psychology 2000
9. Sociology 2000

Plus

10. 10 Courses of the Arts curriculum at the third or fourth year level (Two of the courses must be in the field of Education and one in either English or French)

Bachelor of Teaching (Industrial) Program

1. History
2. English
3. One additional History or English
4. Psychology
5. Mathematics

Bachelor of Teaching (cont.)

6. Physics
7. One of Economics, Politics, Sociology, Philosophy, Classics or French
8. Two courses above the first year level in any non-professional subjects approved
9. 5 Education courses[1]

At the University of Sherbrooke in the province of Quebec there is a two-year course for the training of technical education teachers leading to a bachelor of technical education.[2]

The four Atlantic provinces of New Brunswick, Nova Scotia, Newfoundland, and Prince Edward Island are cooperating on a vocational teacher training program which is centered in New Brunswick. There is also available a separate industrial arts teacher training program at the teachers' college in Truro, Nova Scotia.[3]

The Trends in General Subjects and Industrial Arts Teacher Education

Industrial arts teachers, like their counterparts in the academic disciplines, are thought to require a preparation in three basic areas; namely, a strong academic background, professional education, and

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[1] Summer Session Calendar, University of New Brunswick, 1966.

[2] Canadian Education and Research Digest, Vol. III (December, 1963), p. 255.

[3] Personal letter from D. E. Glendenning, Capital Projects and Secondary Schools Division, Department of Labour, Technical and Vocational Training Branch, Ottawa.

work in an area of a speciality. According to Althouse, however, the practice in Canada has been to defer specific professional training as long as possible and then to compress it into brief and intensive form, usually of only one year's duration. Canadian educators also prefer to entrust the academic and general training of prospective teachers to institutions other than the teachers' colleges.[1]

The type of program envisaged for the future in both the United States and Canada necessitates greater use of university facilities. Ovans, writing in the Alberta Teachers' Magazine, pointed out that a minimum of four years of university education will be required for certification of teachers in Canada by 1975.[2] He also believes that half of the teacher training program will have a common core, regardless of the area of specialty. This is in keeping with the implications and relationships of all forms of teacher preparation to the needs imposed by general education. First and foremost, teachers need to be educated persons so that they can become organizers of learning rather than imparters of factual information. They will also need to know how and why children learn and the process of thinking and individualized learning. The courses and requirements for certification will have to be

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[1]J. G. Althouse, Addresses (Toronto: W. J. Gage Ltd., 1958), p. 182.

[2]C. D. Ovans, "Teacher Education in the Next Decade," ATA Magazine, XLVI, No. 4 (December, 1965), pp. 6-17.

selected on a more perceptive basis for our present "discipline-centered" curriculum. Goodlad suggests that our present curriculum offerings should not be a race after more information but a curriculum core in the form of basic concepts, key ideas, principles, and modes of inquiry.[1]

In order to achieve a basic level of competency for beginning teaching, Clarke of the University of Alberta has urged that all teachers today be prepared in universities. He believes that the status of the university-based program will enhance the teaching profession as a whole and that the quality of the staff that is available in a university setting will ensure worthy standards.[2] The Alberta Teachers' Association is also on record as favoring a minimum of four years of teacher education before first certification. This organization has also stated that, regardless of the shortage of teachers in the subject areas of physical education, industrial arts, cooking, etc., that such teachers still need to know how children learn and behave and possess skill in pupil discipline and guidance.[3] The presidents of provincially-assisted universities and colleges of Ontario state that, "The universities will

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[1]John I. Goodlad, "Directions of Curriculum Change," NEA Journal, Vol. 55, No. 9 (December, 1966), p. 33.

[2]S. C. T. Clarke, "Institutional Autonomy," ATA Magazine, Vol. 46, No. 7 (March, 1966), pp. 6-12.

[3]T. F. Reiger, "Issues in Teacher Education and Certification," ATA Magazine, Vol. 46, No. 7 (March, 1966), p. 13.

have to bear in mind the fact that they are solely and entirely responsible for the academic preparation of secondary teachers."[1] Hall, of the Faculty of Education, Macdonald College of McGill University, would go one step further, for he believes that both elementary and secondary teachers should receive their training at a university or at least a college with university affiliation for the following reasons:[2]

a. those not seeking a degree will not feel that they have been singled out

b. many non-degree students can do university academic work acceptably

c. students would have recognized university credits in their transcripts when they enter teaching

d. it would be easier to proceed to a full degree eventually, and

e. there may be a greater tendency for students to continue their education towards a degree if they originally were enrolled in a university campus

Baker, of the University of Manitoba, is another teacher-educator who believes that in order to avoid categorization of teachers on an unfair basis all teacher education should be conducted by one agency, preferably a university. She also believes that industrial arts is an integral part of general education and therefore industrial arts teachers

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[1] The Structure of Post-Secondary Education in Ontario, Supplementary Report of the Committee of Presidents of Provincially Assisted Universities and Colleges of Ontario, June, 1963.

[2] C. Wayne Hall, "A Teacher Educator's Point of View," Seminar on Teacher Education and Certification (Canadian Teachers' Federation, May, 1966). (Mimeographed.)

should have preparation programs which bring them into the main stream.[1]

The reason for such an insistence upon a university program for teachers appears to be the belief that the scholarly environment and the high quality laboratories and libraries of a university are most conducive to the development of individuals that can teach successfully in our present schools. Feirer and Lindbeck, recognized authorities in industrial arts education, have stated that a "common arms" approach to the academic and educational foundations area of teacher education would, "offer a means of unifying a student's educational experiences and counterbalance the divisive effects of a too-highly specialized program of studies."[2] Wilbur is another prominent industrial arts educator who believes that the general education pattern for industrial arts teachers should be no different than the one for any other college student.[3]

Interviews with both Mr. A. R. Low and Mr. A. J. Buhr, Superintendent and Assistant Principal, respectively, of the Manitoba Institute of Technology revealed that they were very much in favor of any system of teacher education in industrial arts that held promise of producing

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[1]Personal letter from Professor Doris Baker, Faculty of Education, University of Manitoba, May 18, 1967.

[2]John L. Feirer and John R. Lindbeck, Industrial Arts Education (New York: The Center for Applied Research in Education, Inc., 1966), pp. 61-62.

[3]Gordon O. Wilbur, Industrial Arts in General Education (Scranton: International Textbook Company, 1954), p. 15.

quality teachers. Mention was also made of the discussions that had taken place with Dean Brown of the University of Manitoba on the possibility of having some of the work taken at the Institute recognized by the University for degree credit purposes. These discussions apparently have been of a very preliminary nature to date, but the prospects of more serious study in the not-too-distant future and the eventual possibility of a degree program for industrial arts teachers in Manitoba are foreseen.[1]

In discussing the same topic, Dean Brown of the Faculty of Education, University of Manitoba, was a little more specific regarding the present and preliminary stage of thought with respect to a degree program for industrial arts teachers in Manitoba. Dean Brown believed that the University would not be able to accept the present two-year course of the Manitoba Institute of Technology for more than one year on any possible future degree program in industrial arts. At the present stage of discussions there are tentative guidelines for a four-year Bachelor of Paedogogy degree program for industrial arts teachers. The professional phase of the program would be conducted largely at the Manitoba Institute of Technology and consist of two years (twenty months) study where the applicant has the required Grade twelve

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[1]Interviews with Mr. A. R. Low, Superintendent, and Mr. A. J. Buhr, Assistant Principal, Manitoba Institute of Technology, June 2, 1967.

standing of one year (ten months) where the applicant not only has the Grade twelve standing but also holds a general teaching certificate. The second, third, and fourth years of the degree program would be conducted by the University and consist largely of academic courses with a major in industrial education. An industrial arts major would consist of five full courses (30 credit hours) selected from among the various Faculties according to the needs of the program generally and the student specifically. The faculties of fine arts, engineering, chemistry, and science would be among those of greatest concern. A minor of three full courses (18 credit hours) in another subject normally taught in the high school or in a cognate area to the specialty would be required. In the senior year there is a suggestion that three professional courses be provided, particularly in such subjects as "Problems of Industrial Arts" and "Design," etc. The second and third years would be made up of five academic courses while the senior year would be divided into two academic and three professional courses. In reality this degree program would be a five-year program extending from an initial Grade twelve standing.[1]

Conant makes a plea for a teacher's program that would allow forty to fifty per cent of the five year period for general education,

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[1]Interview with Dean A. Brown, Faculty of Education, University of Manitoba, June 5, 1967.

thirty to forty per cent of the time to subject matter specialization, and fifteen to twenty-five per cent to professional education courses.[1]

The American Council on Industrial Arts Teacher Education has suggested the following general education for industrial arts teachers.

		Hours	
a.	Science	6	
b.	Mathematics	6	
c.	Applied Arts	6	
d.	Fine Arts	6	
e.	Social Science	6	
f.	Communicative Arts	6	
g.	Electives from a. to f.	9	(must be outside of major)[2]

This is approximately thirty-eight per cent of the total program whereas Conant would have the following courses and credits for the general education phase of teacher training.

		Hours
a.	English Language and Composition	6
b.	Western World's Literary Tradition	6
c.	History	9
d.	Art and Music	6
e.	Mathematics	6
f.	Science	12
g.	General Physics	3
h.	Sociology and Anthropology	3
i.	Philosophy	3
j.	Economics	3
k.	Political Science	3[3]

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[1]James Conant, The Education of Teachers (New York: McGraw-Hill Book Company, Inc., 1963), p. 99.

[2]Essentials of Preservice Preparation, Ed. Donald C. Lux (American Council on Industrial Arts Teacher Education, 1962), pp. 55-65.

[3]James Conant, op. cit.

This is fifty per cent of the total teacher preparation program.

Woodring would divide the professional aspect of teacher preparation into two parts, i.e., "professional knowledge" and "professional skills."[1] The rationale for professional study being to gain the knowledge, skill, and confidence needed to know how to teach. According to Armstrong and Stinnett, professional education ought to be concerned with developing understanding in the role of the school in modern society and the role of the teacher in American education. Secondly, professional education should be concerned with skills and techniques in managing a classroom, teaching a lesson, preparing instructional material, and in evaluating achievement. Thirdly, professional education should attempt to integrate all skills, techniques, and understandings through a program of student teaching.[2]

Industrial Arts Teacher Education

Industrial arts teacher-educators appear to agree with Conant regarding the amount of time that should be spent in professional courses. They advocate that twenty per cent of the total program of preparation be spent on education courses and, as a rule of thumb,

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[1]Paul Woodring, New Directions in Teacher Education (New York: The Fund for the Advancement of Education, 1957), p. 11.

[2]W. Earl Armstrong and T. M. Stinnett, A Manual on Certification Requirements for School Personnel in the United States (Washington, D. C.: The National Education Association, 1955), p. 12.

that foundation courses, materials and methods courses, and student teaching should each occupy approximately one third of the time devoted to professional education. Traditional course offerings have been educational history, philosophy, and psychology, along with courses in general and special teaching methods plus a period of practice teaching. Among teacher-educators in general there is little agreement as to whether the professional educational work should be limited to the junior and senior years or distributed throughout the whole program. Industrial arts teacher-educators generally prefer the four-year plan as their subject matter specialty is not usually part of the general education course work.[1]

In the area of his specialty, the industrial arts teacher must be provided with a background of industrial skills, knowledges, and techniques. The newer approaches and methods of teaching such as the unit method, individual research and experimentation, line production teaching, and the new emphasis on design make it important for teachers of industrial arts to possess a strong background in the areas of drafting, design, woodwork, metalwork, electricity and electronics, power mechanics, graphic arts, and industrial materials.[2] Feirer and Lindbeck outline what might be considered a typical industrial arts teacher training

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[1] Essentials of Preservice Preparation, op. cit., p. 69.

[2] John L. Feirer and John R. Lindbeck, op. cit., p. 58.

program for present needs.

First Year	Credits
College Writing	6
Physical Science	8
Drawing	2
Woods	2
Introduction to Electricity	2
Metals	3
Graphic Arts	2
Physical Education	2
Electives	3

Second Year	
Industrial Arts Design	2
Advanced Electricity	3
Drawing	3
Machine Shop	3
Man and Society	8
Humanities	6
Physical Education	2
Machine Woodwork	3

Third Year	
American Government	3
Educational Psychology	3
Teaching of Industrial Arts	3
Power Mechanics	3
Wood Finishing Methods	3
Furniture Construction	3
General Education Electives	5
Industrial Materials Laboratory	3
Electives	4

Fourth Year	
Course Planning and Construction	2
Shop Plans and Organization	2
Wood Technology	3

Fourth Year (cont.)	Credits
General Education Electives	5
Directed Teaching	8
Laboratory in Education	4
General Education Problems	3
Electives	3[1]

A comparison of Feirer's outline to other suggested or existing programs of industrial arts teacher programs is shown on Table 15. The table utilizes a credit hour format for ease of interpretation though this is not common in Canadian programs. The transformation of full courses, units, and clock hours into credit hours was done on the basis of six semester credits for each full course at a Canadian university and three credits for each unit. In the case where clock hours are used the allocation of credit hours becomes somewhat complicated though a system of granting thirty credits for each complete year of study was finally adopted.

Of the various Canadian programs for industrial arts teacher education, that of Alberta appears to more nearly meet the requirement of a well balanced program as suggested by the new outlook in industrial arts education. The province of Manitoba has not devised a university program for industrial arts teachers and, therefore, the figures used on Table 15 for Manitoba are gleaned from a brief presented by the Manitoba Industrial Arts Association during 1964. This brief was mainly

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[1] Ibid., p. 64.

TABLE 15

INDUSTRIAL ARTS TEACHER EDUCATION PROGRAMS

Program Outline	Credit Hours			
	General Ed.	Professional	Technical	Electives
Feirer and Lindbeck[a]	41	29	40	10
10 United States Industrial Arts Programs[b]	43	24	42	
British Columbia (Five year Program)[c]	42	48	66	
Alberta[d]	48	24	48	
Saskatchewan[e]	42	48	30	
Manitoba (Suggested by the Industrial Arts Association of Manitoba)[f]	8	77	35	
New Brunswick[g]	72	36.5	33	

[a]John L. Feirer and John R. Lindbeck, Industrial Arts Education (New York: The Center for Applied Research in Education, Inc., 1966), pp. 61-62.

[b]"Re-Evaluation of Industrial Arts Teacher Education Programs" (North Dakota: College of Education, 1967), Mimeographed.

[c]University of British Columbia Calendar, Faculty of Education, 1966-1967.

[d]University of Alberta Calendar, Faculty of Education, 1965-1966.

[e]The University of Saskatchewan, College of Education. Programs Leading to the Bachelor of Education Degree for Teachers in Vocational Education and Industrial Arts. 1966.

[f]Brief Presented by the Manitoba Industrial Arts Association to the Special Committee on Certification of Specialists, 1965.

[g]Summer Session Calendar. University of New Brunswick, 1966.

concerned with the necessity of having a university degree program rather than of attempting to outline specific courses and credits. A closer look at the whole picture of industrial arts teaching for Manitoba would likely result in an increase of the academic work and a corresponding decrease in the amount of professional education.

The Comparison of Secondary Teacher Preparation and Certification for Alberta and Manitoba

The fact that the University of Alberta in Edmonton has a four-year undergraduate teacher training program leading to the Bachelor of Education degree and the Interim Professional Certificate makes it difficult to compare with the graduate program of secondary teacher training of Manitoba. In Alberta there is a range of between 24 to 42 credits for general education, 42 credits for professional education, and from 24 to 42 credits in the major field. Manitoba does not have such a breakdown, though, in practice, an individual's background could quite conceivably be very similar to his counterpart in Alberta.

It would be difficult to ascertain the actual amount of the initial Bachelor of Arts or Bachelor of Science degree of Manitoba that could be allocated to the phases of general education, etc. In the one-year program following the initial undergraduate degree in Manitoba the program can be divided into 0 to 12 credits for academic study and between 18 to 30 credits for professional courses.

A somewhat similar difficulty arises when considering the

respective programs of industrial arts teacher education. In Alberta there is the four-year undergraduate degree program for the Bachelor of Education degree and the Interim Professional Certificate while Manitoba has the two-year program held at the Manitoba Institute of Technology which leads to an Interim Certificate in Industrial Arts. In terms of general education, professional, and technical studies Alberta's program is divided into 48 credit hours for general education in comparison to 8 for Manitoba and 24 credit hours of professional studies to 17 in Manitoba. Technical studies take up 48 credit hours of study in Alberta to a total of 35 in Manitoba.

Analysis of Data Obtained from Teacher Education and Certification Opinionnaires

The sources of data for this portion of the study were industrial arts teachers in the provinces of Manitoba and Alberta, teacher-educators from the University of Alberta and the University of Manitoba, department of education officials from the two provinces, and federal officials concerned with industrial arts education. This population was considered small enough to study in its entirety rather than utilizing any sampling techniques. The number of industrial arts teachers concerned was 113 for Manitoba and 355 for Alberta. There were 38 teacher-educators contacted and 49 department of education officials. All told there were 383 opinionnaires returned out of the total of 555 that were mailed out. This constituted approximately a 70 per cent return for the opinionnaires,

which was considered satisfactory for the purposes of this study.

One reason for selecting these particular provinces for comparison purposes was that Alberta afforded an example of a four-year degree program of teacher education while Manitoba provided the other major form of teacher education in Canada; namely, that of a provincial department of education. There was also a wealth of data available from these same sources that made a comparison of their respective programs a realistic undertaking.

The opinionnaire itself was constructed by the author with the assistance of the personnel of the Bureau of Research at the University of North Dakota. Though the various items of the opinionnaire were composed by the writer of this dissertation there was considerable interaction with members of the Bureau.

The respondent was instructed to mark his opinion on the reference along with an example of the method of marking the data sheet. An example of the opinionnaire and of the directions for marking can be seen in the Appendix. The questions dealt with particular aspects of general and industrial arts teacher education of which the respondent was asked to mark his opinion ranging from strongly agree to strongly disagree on a five point scale. These opinionnaires were sent out during the week of April 1, 1967 and a follow-up letter was sent a month later for those who had neglected to reply.

Once the returns were received the letter responses on the five

point scale were changed, for ease of statistical analysis, into numerical ones ranging from the number 1 for a strongly agree response to a number 5 for a strongly disagree one. The distribution of raw scores, means, and standard deviations was determined for each item and for each group responding. In order to determine whether the differences observed between the means of the various groups were significant, a one way analysis of variance was performed among the groups for every variable of the opinionnaire. For those items where a difference existed between the groups at the .01 or .05 level of significance, it was useful to apply the Dunn's "c" test to determine the nature of these differences between the groups taken two at a time. Dunn's "c" test was utilized rather than the process of calculating multiple "t" scores. The process of calculating multiple "t" tests has been severely criticized because of the violation of the apparent level of significance. Dunn's "c" test protects the level of significance, and is one of several alternate procedures which have been used in testing multiple comparisons. The reason for the specific choice of Dunn's "c" test is that there are unequal sized entries in the three groups which eliminates several procedures, and the fact that the number of comparisons could be effectively controlled. Thus the Dunn's "c" test provided a powerful alternative in this situation.

The summary data and analysis of variance of the teacher certification and education are given in Table 16.

TABLE 16

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 1. All teachers should have the same education in the foundation areas (psychological, historical, philosophical, sociological).

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.272	2.454	2.166
S.D.	1.134	1.262	1.228

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	1.198	0.5994	0.4519
Within Groups	380	504.561	1.327	

Significance level established for F - 3.02 at the .01 level
- 4.66 at the .05 level

The F-ratio of 0.4519 is not significant.

Item 2. Industrial arts teachers should have a different teacher training program in the foundation areas.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	3.420	3.545	3.500
S.D.	1.275	1.335	1.329

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	0.515	0.257	0.156
Within Groups	380	627.667	1.651	

The F-ratio of 0.156 is not significant.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 3. At least a baccalaureate degree should be required for industrial arts teachers.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.250	1.954	2.333
S.D.	1.084	0.9500	1.161

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	2.191	1.095	0.9291
Within Groups	380	448.226	1.179	

The F-ratio of 0.9291 is not significant.

Item 4. At least a baccalaureate degree should be required for high school teachers of the academic disciplines.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	1.846	1.363	1.452
S.D.	0.864	0.5810	0.7054

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	9.719	4.859	6.969
Within Groups	380	264.969	0.697	

The F-ratio of 6.969 is significant at the 0.01 level.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 5. Where there is a two year certification teacher preparation program the content of the program should be determined by the certifying agent (Provincial Department of Education).

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.655	3.545	2.619
S.D.	1.121	1.010	1.167

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	16.639	8.319	6.486
Within Groups	380	487.428	1.282	

The F-ratio of 6.486 is significant at the 0.01 level.

Item 6. All teacher training should be conducted by provincial universities.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.341	1.818	2.476
S.D.	1.212	1.006	1.214

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	6.698	0.3349	2.316
Within Groups	380	549.505	1.446	

The F-ratio of 2.316 is not significant.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 7. At least a minimum of one semester (18 weeks) should be required for student teachers.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.275	1.954	2.452
S.D.	1.132	1.090	1.310

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	3.579	1.789	1.351
Within Groups	380	503.084	1.323	

The F-ratio of 1.351 is not significant.

Item 8. Universities should grant full credit towards a four-year education degree for work done for the two-year certificate.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	1.830	2.181	1.976
S.D.	0.8630	1.139	0.9236

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	3.100	1.550	1.969
Within Groups	380	299.108	0.787	

The F-ratio of 1.969 is not significant.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 9. Universities should grant partial credit towards a four-year education degree for work taken for a two-year certificate.

	Industrial Arts Teachers	Teacher Educators	Department of Educational Officials
n	319	22	42
M	3.394	3.000	3.071
S.D.	1.197	1.195	1.313

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	6.535	3.267	2.229
Within Groups	380	557.019	1.465	

The F-ratio is not significant.

Item 10. At least a bachelor's degree with an academic major is desirable for all teachers.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.683	2.727	2.809
S.D.	1.193	1.077	1.329

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	0.607	0.303	0.209
Within Groups	380	549.862	1.447	

The F-ratio of 0.209 is not significant.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 11. A bachelor's degree for high school teachers should have a double major, i.e. two subjects taught in the high school.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.686	2.409	2.404
S.D.	1.019	1.007	1.083

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	4.186	2.093	1.988
Within Groups	380	4.009	1.052	

The F-ratio of 1.988 is not significant.

Item 12. A bachelor's degree for industrial arts teachers should have a double major in that area of specialty.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.426	1.954	2.333
S.D.	1.043	1.045	1.004

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	4.726	2.363	2.188
Within Groups	380	410.307	1.079	

The F-ratio is not significant.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 13. The final decision for granting university credit for courses requested for certification by departments of education should reside with the university.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	2.648	1.863	2.238
S.D.	1.116	0.940	1.054

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	17.540	8.770	7.230
Within Groups	380	460.888	1.212	

The F-ratio of 7.230 is significant at the .01 level.

Item 14. Trade experience should be evaluated for credit in the major or specialty for industrial arts teachers.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	1.802	2.727	2.285
S.D.	0.8876	1.162	1.042

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	24.308	12.154	14.277
Within Groups	380	323.493	0.8512	

The F-ratio of 14.277 is significant at the .01 level.

TABLE 16--Continued

SUMMARY DATA AND ANALYSIS OF VARIANCE OF DATA FROM OPINIONNAIRE ON TEACHER EDUCATION AND CERTIFICATION

Item 15. Technical institute facilities should be used for the specialized preparation of industrial arts teachers where these are not available at the university.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	1.573	2.318	1.666
S.D.	0.624	0.994	0.611

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	11.483	5.741	13.625
Within Groups	380	160.125	0.421	

The F-ratio of 13.625 is significant at the .01 level.

Item 16. A degree in education should be a graduate degree, occurring after an initial degree in arts or science.

	Industrial Arts Teachers	Teacher Educators	Department of Education Officials
n	319	22	42
M	3.415	3.318	3.357
S.D.	1.117	1.393	1.143

Source of variance	d.f.	s.s.	m.s.	F-ratio
Treatments	2	0.640	0.320	0.247
Within Groups	380	491.414	1.293	

The F-ratio of 0.247 is not significant.

For the items of the opinionnaire where a significance in means between the groups was detected it was useful to apply the Dunn's "c" test to locate the actual groups that differ significantly in their opinions. Table 17 provides a summary of the differences between the groups reporting taken two at a time for those items where the one way analysis had indicated that a significant difference between the means existed.

TABLE 17

SIGNIFICANT DIFFERENCES BETWEEN MEANS OF ITEMS ON OPINIONNAIRE FOR INDUSTRIAL ARTS TEACHERS, TEACHER-EDUCATORS, AND DEPARTMENT OF EDUCATION OFFICIALS

Variable	Higher Mean	Lower Mean	"c"	Level of Sig.
Item 4.	Industrial Arts Teachers	Teacher-Educators	2.77	.05
Item 5.	Teacher-Educators	Department of Education Officials	3.72	.01
	Teacher-Educators	Industrial Arts Teachers	3.56	.01
Item 13.	Industrial Arts Teachers	Teacher-Educators	3.41	.01
	Industrial Arts Teachers	Department of Education Officials	2.59	.05
Item 14.	Teacher-Educators	Industrial Arts Teachers	4.95	.01
	Department of Education Officials	Industrial Arts Teachers	4.37	.01
Item 15.	Teacher-Educators	Industrial Arts Teachers	5.31	.01
	Teacher-Educators	Department of Education Officials	3.53	.01

Significance level of "c" established at 2.39 for .05 level
2.94 for .01 level

Note: Item 4. At least a baccalaureate degree should be required for high school teachers of the academic disciplines.

Item 5. Where there is a two year certification preparation program the content of the program should be determined by the certifying agent (Department of Education).

Item 13. The final decision for granting university credit for courses requested for certification by departments of education should reside with the university.

Item 14. Trade experience should be evaluated for credit in the major or specialty for industrial arts teachers.

Item 15. Technical institute facilities should be used for the specialized preparation of industrial arts teachers where these are not available at the university.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The present study was undertaken to determine some of the factors involved in the preparation and certification of industrial arts teachers in Canada and to devise a recommended program for industrial arts teacher education in Manitoba.

In view of the continued efforts being made throughout the Dominion of Canada to improve teacher preparation and certification practices, an inquiry into the nature of industrial arts teacher education theory and action appeared most timely. Another reason for making this study was to discover whether or not an unwarranted discrepancy exists between general and industrial arts teacher education programs in terms of quality, duration, and opportunity to qualify for degree standing in areas of specialty.

Opinions regarding the nature of industrial arts teacher education were obtained from various printed sources as well as by means of an opinionnaire to see what guidelines were available for an alternative and strengthened program for Manitoba.

A careful review of bulletins, books, reports, documentary evidence, and previous research on the subject of teacher education and certification was made and data pertinent to the solution of the problem were recorded. Data were also obtained by means of personal interviews with representatives of the Faculty of Education of the University of Manitoba and the Manitoba Institute of Technology.

An opinionnaire was the third method utilized in gathering relevant data. This opinionnaire was sent to all the industrial arts teachers of the provinces of Manitoba and Alberta, teacher-educators of the various universities and officials of the Manitoba Department of Education, and other individuals vitally concerned with teacher education in Canada. Altogether there were five hundred and fifty-five opinionnaires sent out and a seventy per cent response. This opinionnaire was analyzed in terms of the groups reporting and on the individual items using a one-way analysis of variance and the Dunn's "c" test.

Teacher education in Canada, as revealed by the results of this research presents a welter of detail with respect to the number of certificates issued and the type of programs each province provides. There is no doubt, however, that the Legislature of each province still exercises its right to determine the nature of teacher preparation programs as established by the passing of the British North American Act of 1867.

Though there was no doubt regarding the agency in each province

that controls the certification of teachers, there does appear to be a closer and cooperative effort on the part of the respective departments of education to work with teachers, teachers' organizations, and teacher-educators in the formation of policy and teacher education programs. These cooperative attempts to improve the status of the teaching profession generally and the delegating of authority for teacher education by the governments of British Columbia, Alberta, Saskatchewan, and Manitoba are all indications of the present methods utilized in administrating and formulating teacher education policy.

In answer to the secondary question of the study regarding the provisions for industrial arts teacher education in the provincial normal schools and universities it was noted that most universities that have degree programs for elementary and secondary teachers also include teacher education programs of degree status for industrial arts teachers. The University of Manitoba has conducted teacher education programs since 1965 for both elementary teachers and high school teachers of general academic subjects. Industrial arts teachers of Manitoba do not have a teacher preparation program of degree status in their own province. The teacher preparation program for industrial arts teachers in Manitoba is conducted by the Department of Education at the Manitoba Institute of Technology.

The preparation programs for industrial arts teachers in the provinces of British Columbia, Alberta, Saskatchewan, and New Brunswick

do not differ markedly in terms of the amount of time and the type of course offerings in the areas of general education, professional education, and of major study from those provided for general academic teachers. Provisions are also made, by the Universities mentioned above, to have courses taken previously under systems of teacher-education conducted by their provincial departments of education evaluated for credit purposes. Industrial arts teachers in the provinces of Manitoba and Ontario do not receive any university credit for their teacher preparation courses from their respective universities and often receive only limited credit on degree programs for industrial arts teachers in the United States.

The present trend in the preparation of all teachers including industrial arts appears to be a four year concurrent program where liberal arts studies are taken along with professional courses and those of a teaching specialty. The example set by the three western provinces of Canada in promoting the degree program for all teachers bears witness to the current belief that a one-year or even a two-year period of preparation for teachers is no longer adequate for the needs of Canada.

There should be little doubt from the reading of this study that the programs for educating teachers in Canada are confusing and often conflicting in nature. This gives credence to the charge that there is little agreement among professional educators as to what studies are required to produce "good" teachers. No two provinces have identical

programs or patterns of preparation or certification requirements. This fact makes any attempt to reach a valid concept of a national standard almost impossible. Even in the matter of admission requirements there is a strange admixture of practices and nomenclature. For example, in British Columbia, Ontario, New Brunswick, and Prince Edward Island the entrance requirement is junior matriculation which is grade twelve, while Alberta, Saskatchewan, Manitoba, Quebec, and Newfoundland require a senior matriculation which is also a grade twelve standing. To add more confusion to the scene it must be recalled that senior matriculation in British Columbia and Ontario is grade thirteen.

Where universities educate all the teachers in a province, there is not universal agreement in respect to having a basic undergraduate degree before starting professional training. In Manitoba, for example, the two years of education required for the Bachelor of Education degree occur after an initial undergraduate degree in Arts or Science. In Alberta, British Columbia, Saskatchewan, and New Brunswick, the four or five-year teacher preparation program also results in a Bachelor of Education degree. It would seem reasonable, then, in suggesting possible guidelines for an improved system of industrial arts teacher education for Manitoba that very serious thought will have to be given to changing the undergraduate degree requirements.

The present trend for industrial arts teacher education is to plan an educational program that allows for the industrial arts teacher to be

as well educated as his colleagues in the other disciplines regardless of the differences in preparation occasioned by the technical nature of the subject matter. The type of teaching required by the contemporary objectives of industrial arts education necessitates a changed program of teacher education. Industrial arts educators in both Canada and the United States have apparently concentrated on the learning of mechanical skills and technical information to the exclusion of the intellectual study of modern technology. The results of this study also revealed that industrial arts is part of general education.

Previously the programs for industrial arts teacher preparation have neglected the area of a general education, particularly during the days when industrial arts was conceived as "shop" or "manual training." All of the recent programs that have been outlined as worthy examples of a well-balanced program of teacher preparation show clear indications of a move to assure that industrial arts teachers will also be "educated" persons.

In dealing with the requirements for certification in industrial arts throughout the Dominion of Canada, it was found that the provinces of Manitoba, Quebec, Nova Scotia, and Prince Edward Island award special certificates to teach industrial arts subjects without first having a general or basic teaching certificate. Ontario, on the other hand, issues special industrial arts teaching certificates that are really supplementary in nature as they are granted after an appropriate period

of preparation in addition to general teacher certification. The difficulty of comparing certification standards and of ascertaining the nature of "special" certification is further complicated by the differences of qualifications required for the lower forms of certification and those of the top rank. In British Columbia and New Brunswick, the lower or basic certificate in industrial arts takes the first two years of the Bachelor of Education degree program. In Nova Scotia the only provision for industrial arts teacher education is a two-year course at a teacher's college. Catholic Quebec has its lowest form of diploma program at a technical teacher's college mostly in pedagogy while Protestant Quebec has a Class III Diploma that requires four summer schools and preparation in technical work. Ontario grants its lowest form of certificate for industrial arts teachers on the basis of an initial general teaching certificate and the completion of two department of education courses of five weeks duration each. Finally, Manitoba grants its interim special certificate in this discipline area on the successful completion of two years of preparation at the Institute of Technology.

Higher levels of certification present an equally complex picture. For example, British Columbia, Alberta, Saskatchewan, New Brunswick, Prince Edward Island, and Nova Scotia require four to five years of preparation for professional certification while Quebec (Catholic) requires a three-year period for the Diploma III certificate.

There is evidence, therefore, of the claim that "special" certificates do not necessarily constitute any marked degree of subject specialization or advanced professional education.

Conclusions

It can be seen that the manner of certifying teachers in the provinces of Canada is still ultimately a matter of governmental responsibility. In the matter of establishing standards, therefore, the problem of supply and demand has resulted in periods of preparation ranging from six-week summer sessions to university undergraduate and graduate degree programs. Teachers in Canada are thus seen to be very much akin to civil servants. There are, however, many hopeful signs for improvement, particularly in the cooperative endeavors of teachers' organizations, teacher-educators, and school trustees to establish standards in teacher preparation and certification.

This study indicated that there has been an increase in the number of provincial universities that have been given responsibility for all teacher education. Most of these same institutions of higher learning have provided degree programs of teacher education for all types of teaching specialities including vocational education and industrial arts. Unfortunately, the actual professional courses of a few of these degree programs do not occur until the fifth year of university study. From a reading of the available literature for this study, it would seem that a

consensus among Canadian educators is in favor of a basic four-year undergraduate degree program of teacher preparation. Where a one or two-year program is still in operation they are often part of the requirements of the more extensive degree programs and, as such, provide incentive to students to continue their education at a later date.

The education or preparation of elementary and most forms of special education teachers has been the last to be included in university-based preparation programs, but the feeling in a number of the western provinces and in New Brunswick is that such teachers need much the same type of preparation, apart from area of specialty, as any other teacher. This type of attitude does much to enhance the teaching profession generally and prevents teachers of non-academic subjects from a feeling of inferiority while, at the same time, allows them to proceed towards a higher degree of competency in their own provinces.

There is still a number of provinces that retain the practice of granting special certificates based on qualifications and training that do not require special education in addition to that received by general teachers. In terms of the extent of training required for these certificates in comparison to that of general teacher certification, it hardly seems feasible to continue thinking of these certificate holders as "specialists."

A number of industrial arts teacher preparation programs, particularly those under the auspices of departments of educations, still reflect the "shop" or "manual arts" thinking of the early twentieth century. The

demands of industrial arts as part of general education and the implication of contemporary industrial arts objectives requires that such teachers need greater exposure to the academic or liberal studies of a university.

It appears that industrial arts educators are challenged by the nature of present technology to change a great deal of their curriculum offerings in order to provide an experimental and problem-solving environment that allows for the intellectual needs of average and gifted students. The making of teacher designed "projects" and the great emphasis on mechanical skills and related technical information are no longer sufficient justification for the inclusion of industrial arts in the general education program of all Canadian youth.

It is difficult, in Canada, to detect anything resembling a national standard of teachers' education or of certification. It would seem that the case for such a national standard for industrial arts teachers in Canada is possibly further removed from any form of general agreement. Though there is no organization approaching that of the United States Office of Education, it would seem to the writer that this should not prevent the provincial industrial arts associations from joining its national body to study the whole philosophy and practice of this phase of a general education.

In this section of the conclusions the results of the opinionnaire are discussed. It can be seen from Table 16, that is a summary of the analysis of variance, that five items of the opinionnaire showed a

significant difference in their means. On further analysis by means of the Dunn's "c" test the significant differences between the means of the three groups responding were located. Table 17 shows the more specific differences of opinion between the groups for the five items that the one-way analysis statistic had indicated.

On item number four of the opinionnaire there was a significant difference of opinion between industrial arts teachers and teacher-educators regarding the desirability of a baccalaureate degree for high school teachers. Industrial arts teachers indicated opinions that were more favorable to the suggestion than either the teacher-educator group or the department of education officials group.

Item number five of the opinionnaire dealt with the question of whether the certifying agent should determine the content of a teacher-preparation program. In this instance it was seen from the Dunn's "c" test that teacher-educators agreed with the suggestion that the Department of Education should determine the content of teacher preparation programs designed for certification purposes. Department of education officials indicated the least favorable response to the question of whether the department of education should determine the content of its teacher preparation courses.

The results of item thirteen of the opinionnaire showed that industrial arts teachers were more in favor of the idea that the universities should make the final decisions in granting credit towards an

education degree for courses suggested by the department of education for certification requirements than either teacher-educators or department of education officials.

In comparing the means of the groups for significance it was seen that the industrial arts teachers had the lowest mean score on item fourteen dealing with university credit for trade experience in the area of specialty for industrial arts teachers. Teacher-educators were the ones who were most in favor of the idea of university credit for trade experience and they were closely followed by the department of education officials in this regard.

With respect to the suggestion of using technical institute facilities for the specialized preparation of industrial arts teachers, it was again quite evident from the data received that teacher-educators were more favorably inclined to the suggestion than the other two groups.

Each of the three groups responding had a tendency to agree with the idea that all teachers should have the same education in the foundation areas. The three groups also agreed that industrial arts teachers should not have a different teacher-preparation program in the foundation areas. Most of the respondents were of the opinion that at least a baccalaureate degree should be required for industrial arts teachers and that all teacher education courses should be conducted by provincial universities.

There was also a great deal of support for the suggestion that at

least one semester be required for student teaching. All indications were present that industrial arts teachers, teacher-educators, and department of education officials were generally of the opinion that full credit should be granted towards an education degree for previous teacher-preparation courses conducted by departments of education.

Finally the results of the opinionnaire indicated an appreciable measure of agreement with the suggestion that industrial arts teachers be required to have a double major in their area of specialty.

Recommendations

On the basis of the findings of this study it is urged that industrial arts teachers be afforded the opportunity of further formal study at the University of Manitoba. It is further suggested in this regard that such opportunity be a cooperative undertaking between the University and the Manitoba Institute of Technology. The technical aspect of the teacher preparation period should continue to be offered at the technical institute in order to avoid costly duplication of staff and equipment while the academic segment and much of the professional studies should be taken on the campus of the University of Manitoba.

There should be a liaison between the Faculties of Arts, Science, and Engineering with the Faculty of Education so that students in the industrial arts teacher programs could receive the best possible standard of education in these various disciplines.

A careful study of existing programs in other provinces should be made, especially that of the province of Alberta, as a basis for developing a program for the needs of Manitoba that is within the ability of the province to finance.

A two-year diploma course should be immediately implemented by the Department of Education and the University of Manitoba which allows for such education to be awarded credit for an undergraduate degree.

A committee of equivalent standings should be called together to determine the problems of credits for work in industry. Such arrangements are made by the majority of universities in the United States and should be considered in the same light as specialized education and experience in music or art for teachers of those subjects.

A four-year undergraduate degree in education should be the goal for Manitoba in the not-too-distant future. In all likelihood this could most easily occur in stages--the first being a two-year program for all future industrial arts teachers similar in intent to that proposed for elementary teachers in Manitoba.

It is hoped that an overconcentration on education courses as such will be avoided in any proposed program for a university-based program for industrial arts teachers in Manitoba.

Should a decision be made that the province of Manitoba cannot justify the creation of an independent program of industrial arts teacher education because of matters of expenditures and number of teachers

involved, it would seem that some form of cooperative endeavor similar to that of the Atlantic provinces should be instigated. This would enable industrial arts teachers to take part of their training at the University of Manitoba while completing their studies at a Canadian university that has a well established program for industrial arts teachers.

The outline of the program suggested by Feirer and Lindbeck and that of Alberta have a great deal in common. They meet the requirements of general education, specialty, and professional competency to such an extent that serious consideration should be given to approaching the University of Alberta for assistance in filling the present void in industrial arts education for Manitoba teachers.

APPENDIX

TEACHER EDUCATION AND CERTIFICATION

OPINIONNAIRE

The following items ask your attitude regarding teacher education and certification.

On the left side of the page is the following scale:

SA A U D SD Where SA means strongly agree
A means agree
U means undecided
D means disagree
SD means strongly disagree

Please respond to each item by circling the response which comes closest to your own position (i.e.) if you Strongly Agree, circle SA.

SA A U D SD 1. All teachers should have the same education in the foundation areas (psychological, historical, philosophical, sociological).

SA A U D SD 2. Industrial arts teachers should have a different teacher training program in the foundation areas.

SA A U D SD 3. At least a baccalaureate degree should be required for industrial arts teachers.

SA A U D SD 4. At least a baccalaureate degree should be required for high school teachers of the academic disciplines.

SA A U D SD 5. Where there is a two-year certification teacher preparation program the content of the program should be determined by the certifying agent (Provincial Department of Education).

SA A U D SD 6. All teacher preparation programs should be conducted by provincial universities.

SA A U D SD 7. At least a minimum of one semester (18 weeks) should be required for student teachers.

SA A U D SD 8. Universities should grant full credit towards a four-year education degree for work taken for the two-year certificate.

SA A U D SD 9. Universities should grant partial credit toward a four-year education degree for work taken for two-year certificate.

SA A U D SD 10. At least a bachelor's degree with an academic major is desirable for all teachers.

SA A U D SD 11. A bachelor's degree for high school teachers should have a double major, i.e. two subjects taught in the high school.

SA A U D SD 12. A bachelor's degree for industrial arts teachers should have a double major in that area of specialty.

SA A U D SD 13. The final decision for granting university credit for courses requested for certification by departments of education should reside with the university.

SA A U D SD 14. Trade experience should be evaluated for credit in the major or specialty for industrial arts teachers.

SA A U D SD 15. Technical institute facilities should be used for the specialized preparation of industrial arts teachers where these are not available at the university.

SA A U D SD 16. A degree in education should be a graduate degree, occurring after an initial degree in arts or science.

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